SEE PAGES 51 AND 52.

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THE ENGINEER.

How greatly an engineer resembles his trade!
Both being so "fearfully and wonderfully made,"
Brave, frank, open-hearted and manly; no fear—
Be he "high" or "low pressure" of a good engineer.
Like their "engines," 'tis likely they all have their faults;
But what "class" are "perfect" 'neath heaven's blue vaults?
Some work "non-condensing," while others "condense";
Some work by "expansion"; all use common sense.

Some "carry high pressure" and, as "boilers" oft do'
"Give way" to that "pressure," "collapsing a flue."
No matter what "tests" or how heavy their "load,"
Be it said to their credit they seldom "explode,"
Though some (though all our fraternity don't)
Will "go on a bust" when their "boilers" just won t.
At abuse he'll "fire up" ahd "foam," "prime" and "cough,"
Just speak to him rudely, you'll see him "blow off."

He is mostly "in line" and correctly "upright,"
Though "eccentric" full oft and a "crank" at first sight,
His visage is truth's "indicator," a "gauge"
Of the "clean" even "fires" in his furnace that rage;
Energetic and pushing, symmetric in "beam,"
He, like a good "valve," "works" a "full head" of steam.
On his "guides" he "works smooth, with no "knocking around";
In good men and "engines" slight "friction," less "sound."

Sometimes they've a "cross-head,"—"tee-head," if you will;
But then they must have them "good work to fulfill."
When you meet this same "cross-head" look out for "loud knocks,"
If he's "out of line" badly or has a "hot box,"
And, brothers, some of us are "rotary," you know,
Some "run at high speed," while the others "run slow";
Still, we've a good "check valve," our conscience, you see,—
Keep it well "lubricated," not "gummed up," but "free."

Have never a "screw loose," nor charity lacking;
Keep clear of the "hump," save to use it as "packing,"
Our "safety valve" let fidelity be,
With "area" large, on its "seat" "working free."
Your "boiler" keep "full," but don't get "full" yourseif,
For when one gets "full" he'll be "laid on the shelf."
Keep your life and your "boilers" of "mud" and "scale" clean,
Shun "compounds," "corrosive," rum, whisky and gin.
The "poker" to draw "fires," on this lay great stress,
Draw-poker, however's a "grate-bar" to success.
Be honor your "governor," not alone "automatic,"
Quite "sensitive" be it, not too aristocratic.
Practice "full economy," keep "everything bright";
Have a "*man*-head"; keep sober, but keep your "keys" "tight."
In life's race "run forward," on each "lap" try to "lead";
"Run steady," "exhausting" all means for "full speed,"
When your "license runs out," to your "doctor" you flee,
And death's "point of cut-off" you plainly can see;
And done with life's "labor," absolved from all cares,
May our tombstones bear record, "laid up for repairs."

HENRY J. PATE.

THE BATES CHAMPION RAPID GRAIN DRYER.—That there is a good deal damp corn and some damp wheat in the Northwest, due largely to late rains and damp weather, will, we think, be readily admitted. The wheat is being got rid off by mixing with the dry article and in that shape may keep in fairly good condition until next spring, when whoever holds it will be likely to hear from it. But new corn everywhere is just about as damp as it was six weeks ago and is altogether too soft to grind, and as but little old corn is available, it cannot, as in the case of wheat, be mixed, even if it were practicable to do so.

The fact is, new corn has got to have something done to it before it will be fit to use in grinding, it being altogether too soft and gummy now. It will have to be dried. The question then comes as to the cheapest and best method for drying it. Fortunately, just at this juncture comes Mr. Bates with his Champion Rapid Grain Dryer and says that he can dry larger quantities and at less expense than any other man, and that, too, without any parch, shrivel or other evidence of artificial drying, or taking out any more moisture than will enable the grain to grade or be put in condition to keep; that he wil thus dry 1,000 bushels or more at a time, or 10,000 to 20,000 bushels per day, evenly and in a perfectly natural way, and that, if so desired, he can make new grain as dry as old, but retaining all the bright qualities of new grain. Further, that his dryer so reduces the cost of drying, including shrinkage, that it is much cheaper for owners to dry their grain than to risk its getting out of condition in storage elevators, as no such shrinkage of weight can possibly occur in any kind of artificial drying as happens when g ain on storage gets out of condition. That shrinkage, by the way, added to shrinkage in value, is a fearful item for the unfortunate owner.

The time is coming, he believes, when proprietors of storage elevators, with the aid of his rapid process, will be able to guarantee the condition of grain stored in their elevators, the cost of drying being scarcely more than it now costs them to keep turning the grain over, as most of them do, during the germinating period and heated spells, to keep it in condition.

He also claims that the construction of his apparatus is such, that by a very simple and wholesome process he can rid grain of weevil.

The attention of persons interested is directed to his advertisement elsewhere.

WHAT THE BURMESE WAR MEANS.

The N. Y. Herald says: It is reported by cable that King Thebaw has become thoroughly frightened at the rapid advance of the British forces and is hastily packing up his household goods for flight to China.

We have been asked to explain what this Burmese trouble means, how it originated and in what it is likely to end. The story is a simple one and also a short one. The Bombay Burmah Corporation leased large tracts of land from the Burmese government and began to cut timber for exportation. The business became very extended under English enterprise, and very profitable.

King Thebaw, who also has an eye to the main chance, came to the conclusion that the royal income from these leased lands was inadequate. He consulted his avarice only, and forgetful of the fact that Burmah has already had two wars with the British at great cost to herself of money and territory, and that another war would probably have the same result, demanded an extra twenty lacs of rupees, or about a million dollars, adding a very ugly threat to have the cash at once forthcoming. To pay this large sum would seriously hamper, if not entirely ruin, the corporation. The aghast leaseholders reported to the Viceroy of India, who in turn consulted with the home government, and in consequence a letter was sent to King Thebaw asking three questions and demanding an immediate answer:—Whether he would suspend his decree until the matter was amicably settled; whether he would submit the matter to arbitration, and whether he would abide by the arbitrator's decision.

King Thebaw at once grew insolent and England at once grew indignant. The gunboats on the Irrawaddy River headed for Mandalay, the King's residence. On their way they have shelled Minhla, and it is reported that the town caught fire and was burned up. On next Tuesday morning they will come to anchor off Mandalay, but King Thebaw, who is as cowardly as he is insolent, will not probably be there to offer the hospitalities of the occasion. A cruel wretch, he dares not face fire. England may annex Burmah or she may not. That will be decided by her opinion of the value of the property. If it will pay her to annex it, she will do so; if not, then not.

WATER POWER AT NIAGARA FALLS.

By Samuel McElroy, C. E.

Under an act of April 30, 1883, of the New York Legislature, five commissioners were appointed to locate a public park at the village of Niagara Falls, which has been laid out to include the water front for about one mile above the falls, Prospect Park at the Falls, with Bath, Luna, Goat and other islands on the American side.

Under this act three commissioners were appointed by the Supreme Court to appraise the value of the lands and other property appropriated for this park, who commenced their sessions in February, 1884, and made a report Oct. 27, awarding an aggregate sum of $1,443,439, provided for by a legislative act of April 30, 1885.

The hydraulic power has been utilized by the hydraulic canal, Witmer grist mill, the upper and lower races and the paper mill on Bath Island; below the falls by Witmer's grist mill at the Suspension Bridge.

The hydraulic canal, about 4000 feet long, runs from Port Day, a point just above the rapids, to a basin near the ledge on the American side, about half a mile below the falls. It varies in width from 36 to 74 feet, minimum depth about 7½ feet, and supplies ten mills, using about 3100 horsepower; a new flour mill is being built, to use 1000 horse power additional. Advantage is taken of the ledge height by tunnels to obtain wheel heads of 50 to 90 feet, turbines being used. This is not included in the park.

The Witmer mill, on the river rapids, was built in 1800. It has four runs of stone, driven by three "Eagle" turbines, and one "tub" wheel, under a head of about six feet.

Two mill races were laid out near the falls, the "upper" and "lower," parallel with each other, fed by the rapids. The former is used for light hotel power, the other has been long in use. Its original wing-wall was extended into the rapids in 1820-21. It furnishes power for two pumps, two carpenter-shops, one cabinet and one machine-shop, a large pulp mill and the dynamo engine and water wheel of Prospect Park and its ferry railway.

On Bath Island, power is used from the rapids for a large paper mill, with two 54 and one 66 inch "American" turbines; head, 12 to 13 feet; about 400 horse power used. These powers were appropriated.

Lower Race Power.—In 1882 an action was commenced by an owner of the lower race, Mrs. Townsend, to obtain a decree fixing the relative supply of water to the several lots, twelve in all, on the race, and Prospect Park, claiming one lot, and a decree was rendered Sept. 25, 1884, by Judge M. H. Peck, referee.

This case became an elaborate investigation of the condition and value of water supply and power here and furnished an important basis for the State case testimony, but the decree was not published when the appraisers concluded their awards, and is now the subject of an appeal to the Court of Appeals. Practically, the suit was an attempt to restrict the supply of the pulp mill, which was the first to properly develop this race, the defendants being Messrs. Hill & Murray, its owners.

For the plaintiff Messrs. C. H. Rhodes and C. H. Pifer were counsel; Messrs. C. S. Olmsted, L. E. Nichols, Benj. Rhodes, civil engineers; Prof. I. F. Quimby, A. P. Burdick and J. Phillips, machinists, as experts. For defendants, G. J. Sicard, Esq., counsel: W. F. Noyes, M. S. Otis, W. A. Philpot, millwrights and machinists, as experts. In the State case, where value of power became prominent, the witnesses for Hill & Murray were Clemens Herschel, C. E.; R. Rossiter, Supt. Paterson, power; W. A. Nixon, paper manufacturer; D. T. Mills, turbine builder; Messrs. Noye and Otis, several machinists, and Samuel McElroy, C. E., consulting expert, in both cases.

The several points presented may be thus stated:

Relative value of water power depends on the quantity, head and regularity of supply, and its purity; on facilities for receipt and delivery of supplies and productions, and for labor and repairs; on the perfection of mill and machinery, and operation; quantity legally controlled; local conditions, and standards of similar power.

Quantity of supply: Source, Lake Erie; distance by river, 22 miles; time of river flow, 6 hours; flow of river, about 18,000,000 cubic feet per minute; power of whole falls, at 150 feet, 3,600,000 horse power on shaft; area of lake, 9,600 square miles; fluctuating range, about 1.8 feet; prevalent winds, W. and S. W., tending to keep up levels for about 70 per cent. of annual gales; flow uniform, day and night.

Race obstruction by sludge ice, not to exceed a week in winter; cost to clear, about $350; winds produce occasional changes up to 1.5 feet; tail races rise and fall with inlet; virtual fall not impaired.

As compared with other powers, the Merrimack at Lawrence, draining 4,453 square miles, fluctuates from about 2,600 cubic feet per second in September to 18,000 in May; the general variation of head at Lowell is 5 feet on the upper fall of 32, and a reduction of 6 feet is sometimes caused by floods; the best head, where dams are used (from flood rise on the tail races), being in dry weather, if the supply does not fail. The Connecticut, at Holyoke, varies from 36,000 cubic feet to less than 2,500 per second; the Hoosatonic, at Kent, from 887 cubic feet per second in May to 263 feet in August; the Mohawk, at Cohoes, draining 2,830 square miles, runs down to 980 cubic feet per second, mill supply, in the dry season; the Genesee falls are often dry at Rochester. Water wheels are subject to serious ice obstructions in winter, and few mills can be run, day and night continuously, summer and winter, as on this race.

Relative levels above mean ocean level: Lake Erie, 575* feet; Gill Creek, mouth, 566; Port Day, 564; Upper Race Inlet, 560; Lower, 542; Top American Fall, 515; Bottom, 350; Lewiston, 248.5; Lake Ontario, 246.5. Rapids fall about 46 feet in three-quarters of a mile.

Purity of water supply may affect the durability of turbines by comparative wear, and does seriously affect the value of certain productions, like paper pulp. The race supply differs essentially from that of Bath Island in this respect, and the pulp commands a better market. The depurative effect of Lake Erie on mechanical and organic impurities is important.

* A bench discrepancy at Albany, between the Coast Survey and United States engineers, leaves this level in doubt; other checks make it nearly as given.

Freight facilities: With seven trunk railways, West, South and East, and with river, canal and lake navigation, direct access is had to the best supplies of timber at the lowest cost, and sharp competition exists for receipt and delivery of mill supplies and productions. Railway rates for pulp per 100 pounds to New York, 13 cents; Boston, 18 cents, St. Louis, 15 cents; Chicago; 13 cents; Wilmington, 15 cents; pulp from Paterson to New York, 17 miles, 9 cents; paper, Philadelphia to New York, 90 miles, 17 cents; rates from Holyoke much higher than Niagara. Labor and repairs, for the same reason, can he promptly and cheaply had.

Mill and machinery are of the best type. Mill of stone work on rock foundations; steel shafting; one 13, one 54, one 66 inch "American" center-bent wheels of the best pattern; Otis patent pulp grinders of high efficiency; electric lights; machines of the best pattern, operated day and night, except Sundays.

Inlet, formed by a wing wall built into the rapids, which fall 18.44 feet in 0.224 mile, above it, and enter them with chutes of 17 to 20 feet per second velocity; length about 360 feet, width about 50, ordinary flow about 72,000 cubic feet per minute; waste, 30,000 to 37,200 cubic feet; capacity easily increased by deepening the entrance.

Race: Supplied from inlet by 9 gates, 6 of 4 feet by 4½, 3 of 4 feet by 5, seldom fully open; length, about 645 feet; width, 30 to 35 feet; depth, about 7½ feet; usual current, 1½ feet per second; ordinary use for power, 31,000 to 41,000 cubic feet per minute; waste, 3,800 cubic feet; capacity easily increased. Use of power: Lot 2, 5½ feet head, 5½ horse power; No. 4, 8 feet, 12 horse power; No. 6, 17½ feet, 18 horse power; No. 8, 12 feet, 12 horse power; No. 10, 9 feet, 30 horse power; No. 12, 9 feet, 10 horse power; No. 16, 17½ feet, 425 horse power; Prospect Park, 12 feet, 25 horse power; wheels, except on No. 16, of low duty, of "Tub," "Flutter," "Smith" and other patterns, from 20 to 30 per cent. duty. Loss of head, inlet to pulp mill forebay, inlet, 0.20 foot; gates, 0.25 foot; arches and race, 0.55 foot; total 1 foot.

Quantity controlled: Under the grant of Jan. 30, 1840, each lot on this race was entitled to "so much water as will be sufficient, by a prudent use thereof, to drive two runs or pairs of millstones, upon such water-saving principles as are usually adopted by skillful engineers and builders."

The proper interpretation of this grant was the key to the contest before the Referee, and on the supply and power required for a "run of stone" in 1840 the following testimony was presented:

Run of stone: The "shaft" power required for grinding depends on careful adaptation of their structure, forms, weight and bearings to the work; diameter, or rubbing surfaces; sharpness, or "dress"; coarseness or fineness of "set"; speed; weight, hard and tough or soft texture, moisture or dryness of grain, and fineness of flour produced. The power for mill machinery in elevating, separating, bolting, cleaning or regrinding the grain and its products is additional, and varies with relative perfection of design and workmanship, and amount of work required.

Similar pairs of buhr stones may differ at times 33 per cent. in duty (Emerson, Hyd., p. 297); former 5 and 6 foot diameters are reduced to 4½ or less, to reduce friction; neg-

ect of dress may reduce 11¼ bushels per hour to 5⅜ (D'Aubuisson, Hyd., p. 450). One run in five or six is generally idle for dressing; 16⅛ to 20 per cent. more power required on runs at work; old speed of 90 to 100 revolutions, or high speed of 175, modified to 150, for 10 bushels per hour. Weight per bushel: Wheat 60 pounds, flour 40, corn 56 pounds, meal 55, rye 56 pounds, flour 22½, oats 31 pounds, meal 16⅜; with corn as standard, 4½ per cent, more or 45.7 less weight in grain, and 61.54, or 40 in flour. Resistance of Dent corn or red wheat may be double that of softer grain, and thin shell, hard spring wheat or tough shell softer winter wheat, differ seriously. Moisture may add 22 per cent. resistance; grade of flour is also different. So, as to extremes, and not as to uniform conditions, D'Aubuisson (p. 449) concludes that "with the same fall, water and stone," or power, "the quantity ground may vary as three to one."

Since 1870, the purifying and regrinding machinery has been added, and better machinery has been made for the same work.

Usual work: Taking wheat flour as standard, the power per run depends on the quantity ground, for which a moderate standard, determined from a large number of mills, was taken at 10 bushels per hour.

The shaft power, deduced from a number of cases, for tbe best modern mills, for 10 bushels per hour, was taken as a minimum at 7.5 horse power for grinding, 4.5 mill machinery, wheel (75 per cent.) 4, or 16 "water" horse power in all.

Mill work of 1840: Except at a few centers, where active demand justified expensive wheels, pits and machinery, much less perfect wheels and machinery were used and greater power required.

The horse power standard of leading authorities in mill work of that day was above that of the present. Buchanan's Millwork, 1841, uses 44,000 foot pounds; Desagulier the same; Watt, in practice, also; Evans (Millwright's Guide, p. 117) quotes 41,555 foot pounds British test; D'Aubuisson takes 40,-202.

About 1 horse power per bushel per hour, or 1.22 to 1.33 standard, has been generally assumed as the grinding work of a "run."

D'Aubuisson assumes, for wheat, 1.29 horse power (standard) for grinding alone; a British government experiment quoted is 1.29 (standard).

For "water" power, ten cases cited by him, including mill machinery, average 4.744 horse power per bushel for 33.8 per cent. average wheel duty, or 2.672 horse power at 60 per cent., er 26.72 for ten bushels per hour, this being the duty of the best Lowell wheels. Among these cases, Providence mills, 2.414 horse power per bushel; Bayard, Toulouse, 2.96 horse power (wheel, 43 per cent.), and a number of United States mills (from Evans) of 3.14 average, with 41 per cent. wheels.

Evans (p. 106), 5 foot "run," 97 revolutions, grinding only 2.56 horse power "water"; p. 111, 2.61 horse power; p. 174, overshot, 4.63 horse power per bushel "water," at 60 per cent. wheel 2.778 horse power "shaft."

In an Oswego case, an award gave with a Reynolds wheel (worth about 40 per cent. part gate, 50 per cent. whole gate), 38.59 horse power rate for 2,000 cubic feet on 10 foot fall.

This gives, for grinding, an increase, from 7.5 horse power "shaft" of best modern mills to 12.5 to 26, and for wheels, runs and machinery, an increase from 16 to 24, 25.6, 26.1, 29.6, 31.4 and 47.4 horse power, with wheels of varying duty and poorer machinery.

The deduction was 12 horse power wheel (60 per cent.), 13 grinding and 5 machinery, or 30 horse power in all, or 18 horse power "shaft"; ordinary wheels, not over half this duty.

Local conditions: In connection with this analysis it was shown that no local demand existed for any higher class of wheels and mills than those used for this or similar races, and any "skillful" engineer would adapt his structures to their uses at the time and place. With one railroad, to Lockport only, a canal not enlarged until 1852, 1,277 population in 1840, and 1,468 in 1850, and a superabundance of water, expensive wheels and pits would have been out of place. Undershot, tub, scroll, and wheels of that class were generally in use, with 16 to 33 per cent. duty.

Power in use: A race measurement showed 10,350 cubic feet water per minute, used with 3 of 5 grinders, operating without the electric wheel on, for a virtual fall of 16⅛ feet or 320 horse power water, 240 "shaft"; full mill use would take about 400 horse power "shaft," plus 12.23 for light, the rated wheel power being 425.

Judge Peck's decree allots for the original head of 8½ feet on Hill & Murray (increased by them to 17½) 20 horse power "per run" for wheels of 30 per cent. duty, or 4.152 cubic feet per minute, or for 7 runs 29.064 cubic feet per minute. For wheels of 75 per cent. duty now in use, this, at 16½ feet head, equals about 679 horse power.

Value: In the testimony on this point it was claimed that, while water powers have no common "market value," in the sense of frequent advertisement of rates and transfers, and valuable powers were scarce, the actual value should be judged by the local conditions above named, and by the rates which have been paid at similar milling centers for similar power, as at Lowell, Cohoes, Holyoke, Paterson, Philadelphia, etc.

The old standard lease rate at Lowell, Lawrence, Cohoes and Holyoke is practically about $20 per horse power "shaft" rent per year for mills running usually 10 to 11½ hours per day. At the "Belvidere," Lowell, from 1876, the time is limited to 10 hours; in these cases a low rate is asked to induce sales of land and population increase, the practical rent of Lowell being about $36.50 per horse power at the mills. The Essex, Lawrence and other mills let rooms and power at $75 per horse power, room additional; 8 cents per square foot sometimes.

Mill Power Standards.—Lowell: Right to draw during 15 hours in each day of 24, 25 cubic feet per second, at upper fall, when head and fall is 30 feet (low water 33 feet); 60.5 cubic feet on 13 feet middle fall (low water 14 feet); 45.5 cubic feet on 17 feet lower fall (low water 19 feet); "shaft" power taken at 60 horse power.

Wamesit dam, Concord River: 27 cubic feet per second on fall 21.89 to 24.97 feet; average, 23½ feet; time limit, 11½ hours. Rate, 27 horse power; price, $2,750 rent.

Lawrence; 30 cubic feet per second, on 25 feet head and fall, limit 16 hours per day, varying with actual fall, less 1 foot. Ordinary summer fall, 28 to 29 feet.

Cohoes: Orifice, 50 inches by 2 inches, under 3 feet head and 17 feet fall, 6 cubic feet per second; rent, $200; about 120-750 Lowell power; 3 falls of 20 feet, virtual.

Manayunk, Pa.: 3 feet head and 18 feet fall. 24 hours, $6 per square inch; $56.25 per horse power "shaft."

Paterson: Orifice, 24 inches by 6 inches, 3 feet head and 19 feet fall, 8½ cubic feet per second, 21.19 horse power "water," 15.9 "shaft;" rent, $750, 47.18 per horse power "shaft;" 3 falls of 22 feet, virtual.

Birmingham, Conn.: 1 square foot, 5 cubic feet per second, 12.5 horse power, 12 hours; rent, $250, $20 per horse power.

Dayton, O.: 15 inches head, 233⅓ cubic feet per minute, one run or power, 3 falls, 300 cubic feet per minute on 12 feet; 5.25 horse power "shaft;" rent, $200, $38 per horse power. On the "lower race," for an actual use of about 64 horse power, $1,815 rents were paid, including structure; one tenant paid $550, using 10 horse power about 10 hours. In our water supply appropriations for cities, our notes show over $100 per horse power paid in various cases.

Rentals of steam power much exceed those of water; $2 and $3 per week are common rates; the Sears estate, Boston, gets $175 per year; at Lowell the lowest price is $100, and the Central Pacific mill, with 1,000 horse power, steam, prefers to pay $60 per horse power annual rate for extra water, for "months together," to running its engines (Sudbury River case, p. 73). To substitute equal steam power, in another location, would cost $21,250 annually to Hill and Murray, or $425,000 capitalized at 5 per cent.

On the other hand, the proprietors of the Hydraulic Canal, having bought it for a small sum, to induce tenants, have made several very low leases; one has a sliding scale of $4 per 600 to 1,000 horse power up to $5.30 for 250 to 300; other leases are $5 and $10; but the supply is not fully maintained. A recent applicant has been charged $25, without guarantee; and I am retained in a case where power for additional machinery provided has been refused.

Mr. Herschel's testimony shows: Holyoke, power delivered by day, 15,000 horse power, night 8,000; about 70 tenants; investment about $3,000,000; population, 30,000; day and night price, $40 per horse power. Hill & Murray power equal to 8 Holyoke mill powers, each of 60 horse power "shaft," worth $30,-000 each, or $240,000.

My valuation was for a minimum of 320 horse power "shaft," at $40, $12,800 rent, or $256,000 capital, at 5 per cent. Valuation of lands, $26,000; mill, $13,000; machinery, $30,-000.

The State award was $81,690 for the entire claim, of which, it is said, the allowance for water power was based on 105 horse power at $10. This is another illustration of a curious experience in public works, under which men of the highest character, individually, when acting jointly, sometimes seem to mutually disintegrate the plainest conclusions of duty to sufferers under the law of "eminent domain."

"Does your family play ball?" was asked of a little shaver. "Me and ma does," he replied; "I bawl and she makes the base hits."

SONG OF THE MILL.

O listen to the water mill, through all the livelong day—
"Your salary will stop about the time you lose your pay;
The fellow at the ladder's top, to him all glory goes,
And the fellow at the bottom is the fellow no one knows.
No good are all the 'Had beens,' for in country and in town,
Nobody cares how high you've been, when once you have come down.
When once you have been President, and are President no more,
You may run a farm, or teach a school, or keep a country store,
No one will ask about you; you never will be missed
The mill will only grind for you while you supply the grist."

—*Burdette, in Hawkeye.*

We will send the American Miller, The Northwestern Miller (weekly) and the U. S. Miller for one year for $3.00.

TOPEKA, KS., FLOURING MILLS.

Probably the most important commercial industry in the city is that of milling, which has increased in extent and improved in the quality of the product very materially within the past two or three years. Topeka now has five mills, viz: The Shawnee Mills, Topeka Mill and Elevator Company, Inter-Ocean Mills, Crosby Mills and the Central Mills, all of which sell the most of their output in other markets.

The Shawnee Mills, owned by Shellabarger & Griswold, has a capacity of 300 barrels of flour per day, manufactured by the roller process, for which new machinery has recently been introduced. Their sales extend all over the country, being largely in Iowa, Nebraska, Missouri, Texas and Illinois. Their principal brands are "Shawnee Fancy" and "Topeka Patent."

The Topeka Mill and Elevator Company was organized about three years ago, and a large modern mill was erected in an advantageous location, by the track of the Atchison, Topeka & Santa Fe railroad. Mr. Noel, the superintendent of the mill, visited the great mills of the country, and learned all that he could concerning means and methods of manufacturing the best flour. He then bought a first class mill of the roller process, and commenced at once the manufacture of 300 barrels of flour per day, and also the manufacture of pure linseed oil. In order to obtain flaxseed the company encouraged the growth of it by furnishing seed to the farmers, who are now reaping a large reward from the culture of the product. The company uses up 60,000 bushels of seed per year, making twelve barrels of oil per day. They find a ready market and a steady demand for all the oil that they can make. The success of their venture from the start, induced the company to strive to attain still nearer to perfection, and new machinery has been introduced and added, until the system has been practically changed throughout and the Topeka Mill and Elevator company now has the most complete mill of its size in the country. Its principal brands are "Leiter patent," "Hackney patent," "Noel patent," and "Noel No. 1." The product is in demand everywhere and the entire output of the mill is sold readily. The present capacity of the mill is between 400 and 500 barrels per day.

The Inter-Ocean Mills were originally provided with burrs, when it was started in 1879, and had a capacity of 100 barrels per day. The burrs were rejected some years ago and gave place to the complete roller system, the capacity being then increased to 300 barrels per day. Last summer this was doubled, so that they have now a capacity of 600 barrels per day. They find a ready market for their product in Kansas, Iowa, Missouri and Nebraska. Their principal brands are "White Loaf," "Buffalo," and "Reindeer." Their mill is complete in all respects and they report business very good.

The Crosby Roller Mills are the newest, having been erected about two years ago by the Crosbys, of Minneapolis and capitalists, of Topeka. They have a capacity of 300 barrels per day. When the mills were started, it was with the idea of exporting most of the product, and a heavy trade was worked up for that market. It was found, however, that the mills could spare some of the product for this country, and the efforts of the proprietors have recently been directed nearer home, with a gratifying result. Their principal brand is "Crosby's Best."

The Central Mills, of North Topeka are the oldest in the city, and are now operated by Mr. J. B. Billard. Their capacity is 50 barrels per day. Their product is extensively sold in Kansas, where they are always in competition with other dealers. Their capacity for meal, hominy and feed is greater than that for flour.

Messrs. Edson & Beck are proprietors of the Sixth Avenue Feed mills, and are properly classed with the millers, though they do not manufacture wheat flour. They make a fine article of rye flour, which is being sold all over Kansas. They also grind corn and buckwheat, and sell the entire product readily. They are large manufacturers of meal and Graham flour, which is in large demand all over Kansas.

The Downs mill and Elevator Company was formed for the manufacture and sale of meal and buckwheat flour, principally, and has achieved a very gratifying success. They are now exporting large quantities of meal to the South, and are highly elated with the cordial relations established with the southern merchants. They ship meal to the East, also, and dispose of their buckwheat flour in Kansas, largely. There is a heavy demand for it, and their sales are rapid.—*Topeka Commonwealth.*

We will send Harper's Magazine and the U. S. Miller for one year for $4.20, or the Century Magazine and U. S. Miller for $4.60.

THF OLD STONE MILL AT NEWPORT, R. I.

A Newport, R. I., correspondent of *The Boston Journal* says: Antiquarians and archæologists of many a land have gazed upon Newport's mystery of mysteries and sighed for some revelation that would confirm them in this theory or in that as to its origin and the uses to which it was put. But they have sighed in vain, although they have not sighed alone, for during the last summer, particularly, many anxieties have been expressed and felt about the safety of the mysterious structure, to gaze upon and examine which men have come purposely from across distant seas. Not a few archæologists have inspected it this summer, and many of these gave it as their opinion that, unless speedy measures were taken for a thorough overhauling, the grand old structure would rapidly decay and ere long tumble into a heap of stones. Some years ago some English ivy was planted around the old stone mill, and with the rapid growth peculiar to its nature soon spread in every direction until nearly every inch of stone was covered up. About twenty-four years since attention was called to the fact that this ivy was rapidly working destruction to the mill, and thrusting out large quantities of mortar, which caused the stones (which many believe were handled by Norsemen, while others aver that the structure was the work of Druids) to be loosened, rendering the whole pile in a dangerous condition. The ivy was finally removed and the building resumed its original appearance. Of late years the building has been growing shaky, and finally, public attention was attracted to its condition in a very forcible way. The city authorities took hold of the matter after some delay, and it is satisfactory to learn from the committee's report that, although the work of preservation has been somewhat expensive, it is complete, and that the old mill is now in condition to withstand for many years the destructive forces of the elements. How bad a condition the curious structure was in, may be gathered from the fact that the architect's report states that the old mill was found to be in an unstable and dangerous condition. The upper walls were badly cracked and for about two feet down from the top the old mortar had almost entirely disappeared from between the stones. This portion of the wall has now been laid in Portland cement mortar, the stones being removed individually and replaced in their original position, and the joints have been raked out roughly, to preserve all the characteristics of rude rubble-work. When any new stones were required, they were taken from among the sea-worn ones on the beach, care being exercised to obtain the same class of slate and granite as was used by the original builders centuries ago. The top of the wall has been carefully cemented over in a slightly rounded form, to stop all future infiltration of storm water. Where the walls were cracked, bond-stones have been inserted across the seams, and all the work made secure. The arches, piers and upper walling have been examined, and all open joints filled in, the outer faces having been left rough and open. All the windows, mortices for beams, portholes, fireplace, etc., have been treated in the same way. All the old portholes and one window, which in course of time had been filled up with brick work, were opened and left as originally built. This brickwork was evidently the work of late occupants, fitting the old mill for their own uses, and not a portion of the ancient structure. The fact that the mysterious old structure has been placed in such thorough order will be most gratifying news to the *Journal* readers interested in archæology, particularly as the mill is claimed to be the oldest structure in the United States, and now restored to its original appearance. The citizens are rejoicing over its complete restoration, for they regard the old stone mill as one of the things to be treasured more than fine gold or precious stones.

We will send the Deutsch-Amerikanische Mueller and the U. S. Miller for one year for $1.50.

UNITED STATES MILLER.

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ALL persons connected in any way with the milling industry will find it a blessing to have a copy the UNITED STATES MILLER sent regularly to their address. We will send a sample copy of it free to all in the trade who may apply to us for a copy. You can examine it carefully, read our premium and book lists, and we believe that you will, after a fair inspection, feel that it is *to your interest* to subscribe. It only costs, with premium, one dollar per year. The UNITED STATES MILLER has been published nearly ten years, and the experience and knowledge gained by its publisher in that time is a sufficient guaranty of a valuable paper.

AN era of speculation seems to have set in again, not only in New York, but throughout the country.

We will send the U. S. Miller and Northwestern Miller for one year for $2.50.

MR. HOMER BALDWIN, the well-known miller of Youngstown, O., has been experimenting for a long time on a method for the purification of "straight" or "clear" flour, and has, it is claimed, successfully solved the problem. A method by which all impurities can be removed economically is greatly to be desired.

MILLING IN BUDAPEST, AUSTRIA-HUNGARY.

The report recently made by the Budapest mills shows that there are eleven firms engaged in the milling business, employing a total of 363 run of stones, 840 roller mills and eight reduction machines of a different kind. The power is derived from 124 boilers and engines, yielding 10,340 horse power. Their total daily capacity aggregates 70,583 bushels (American measure), and the amount of grain ground in 1884 was 20,023,720 bushels, yielding probably four and a half million barrels. The mills employ six technical managers, thirteen commercial managers, sixteen head millers, fourteen engineers, and three hundred other skilled employes, 1,876 laborers, 243 assistants in the engine rooms, 492 men in the warehouses, 226 mechanics in the shops, six of the mills are lighted by electricity exclusively, one by gas and electricity in part and four by gas entirely. Nine of the mills are owned by incorporated companies and have yielded during the last few years an average of 13 per cent per annum upon the capital invested. The marked development of the Budapest milling interest dates from the year 1864, and their output for the last ten years has been three times as large as that of the previous decade.

MILL OWNERS should not fail to answer the inquiries on another page concerning capacity of mill, power used, etc., at once. It is to *your* interest to do so. Don't be behind others in making replies. We have taken the pains and expense to fix up a blank in the paper, so that you will have but little trouble to comply with our request. *No mill owner who considers himself of any importance* should fail to take advantage of this opportunity to be fully and correctly reported in CAWKER'S FLOUR MILL DIRECTORY for 1886.

We will send the Scientific American (weekly) and the U. S. Miller for one year for $3.50.

DECEMBER CROP REPORT OF THE OHIO BOARD OF AGRICULTURE.

The following are the final estimates given in the forth-coming December Crop Report, for the crops of 1885, together with the wheat, rye and barley sown this fall for the harvest of 1886. Bushels per acre and total bushels are in round numbers. Percentages are compared with five years average unless otherwise specified.

Wheat.—Bushels per acre, 8; per cent., 53; total bushels for Ohio, 21¾ millions; total bushels United States, 310 millions; sown for crop of '86 in Ohio, 2,676,000 acres, 101 per cent. of area of 1885; condition of same now, 97.

Corn, 1885; area, 108; yield per acre, 39 bushels; total, 112 million bushels. or 115 per cent. of five years average.

Rye, 1885; 396,000 bushels, or 87 per cent. Rye for 1886; area, 94; condition, 96.

Barley, 1885, 589,000 bushels, or 75 per cent. Barley for 1886; area, 92; condition 97.

Oats, total, 42 million bushels, or 200 per cent. of five years; average total: bushels per acre, 35; quality 93 per cent.

Potatoes—Bushels per acre, 85; per cent. 79 of full average crop; lost by rot, 7 per cent.

Clover-seed, 42 per cent. of average crop.

Tobacco, 100 ditto.

Sorghum, 98. Live stock; condition, 100.

Apples, 48 per cent. of full crop.

Grapes, 65 ditto.

The crop of oats is the largest on record, and the crop of corn the largest, probably, unless it be crop of 1878. Live stock, fall-sown grains and meadows and pastures "go into winter quarters" in excellent condition.

W. I. CHAMBERLAIN, Secretary.

Columbus, O., Nov. 25, 1885.

A WORD ABOUT CIRCULARS.

A prominent miller was in our office a few days ago when our mail came in. While talking, we separated some half dozen circulars from the letters and placed them in a pile by themselves.

"What are you going to do with those circulars?" he asked.

"Read them or, at least, glance over them to see what they are about, and if of interest to us then read them," we replied.

"That is right," said he. "I have known many instances in which business men have missed obtaining information of great value to them, simply because they "chucked" their circulars into a waste basket without examination. It is hardly supposable that anyone will go to the expense of printing and sending you a circular unless they think that it will interest you. Of course, they intend to make money out of it in some way, but may you not also make money out of it? It takes a few minutes' time, of course, but we believe business men will find in the long run that it will pay to read their circulars."

We believe the gentleman is correct in his views.

BOOK NOTICES.

We have received from the American Iron and Steel Association, and in pamphlet form, the letter addressed by the Association in reply to a circular letter of Hon. Daniel Manning, Secretary of the Treasury. Like all of its publications, the reply is exhaustive in the information it imparts relative to the cost of manufacturing iron and steel, etc. It will well pay for a perusal by any one interested in the subject.

ARE ALL HAND FIRE GRENADES HUMBUGS?

Mr. P. G. Tower, B. S. of the Agricultural College at Lansing, Mich., has made some experiments regarding conditions of inflammability and efficacy of fire extinguishers, which are reported to an exchange by Prof. F. S. Kedzie as follows: A Harden hand grenade was opened, and the solution contained qualitatively analyzed. It consisted of common salt, sulphate of lime, and a small amount of acetate of soda. The principal ingredient was common salt. Upon trying a number of these grenades upon a bonfire, no effect was visible. Very fortunately at this time a general agent from the company was in the vicinity and consented to give an exhibition of the fire extinguishing qualities before the students of this instution. Being provided with a vertical platform of pine boards, six by eight feet in size, he poured kerosene on the wood, and then coated the surface with North Carolina pitch. Setting this on fire he allowed it to get well to burning, and then throwing in rapid succession six of the pint grenades, he succeeded in nearly extinguishing the fire. Taking this exhibition as a fair example of what the grenades could do in skilled hands, the effort was made to determine (1) whether the solution in the grenades had any more extinguishing power than water; (2) if the solution had extinguishing power greater than water, what was the essential ingredient in the solution.

The question that first arose regarding the composition of the grenades was: Did they contain carbon di-oxide gas, or any substance which would give up the gas by being heated? Opening the grenades under water and collecting the gas that escaped, it was found that the average amount of carbon di-oxide contained was about one cubic inch per grenade. Boiling the solution liberated a slight amount of gas in addition; but altogether the gas was not enough to be of any practical benefit in extinguishing the fire. It was then certain that the extinguishing power was in the solution itself. Replacing the solution in the grenade with pure water the extinguishing power, while greater than water thrown from a dish upon the flaming boards, was still much less than the power exerted by the solution.

By a careful series of trials we found that the essential ingredient is common salt. From a number of experiments it was found that when a grenade, or bottle containing a strong brine, was broken, in the midst of the burning kerosene, the flames were almost instantly extinguished. A vapor seemed to spread in all directions from where the salt solutions struck the board, extinguishing the flame as it went. Strong solutions were also made of sulphate of soda, hyposulphite of soda, borax (biborate of soda), and bicarbonate of soda, and tried as extinguishers. Some worked as well, but none any better than salt in extinguishing fire. The experiment was then tried of charging bottles with brine and generating carbon di-oxide by adding lime dust and sulphuric acid and corking tightly. No practical increase in extinguishing power from this addition was noticed. In most instances, the carbon di-oxide gas escaped from the bottle inside of four days, proving that it is impracticable to attempt to use glass vessels with corks as a means of storing CO_2, under pressure for fire-extinguishing purposes.

The conclusion arrived at from these and many more experiments, was that the Harden grenade solution possessed much greater extinguishing power than water alone, and that it owed this power to common salt held in solution. We then constructed some home-made grenades, using flat bottles, bound together side by side with wire. Using two bottles in this way insures their being broken on striking the burning body, which would not always occur when only one bottle was used. Bottles thus charged with brine and bound together were broken side by side with the Harden grenades and found to be equally valuable. It thus appears from the experiments that any person can construct as good and effective grenades as those offered on the market at $7 and $10 per dozen. Bottles filled with brine and placed around the premises, will afford considerable protection, especially when used on the flames when the fire just begins. Salt solutions have the further advantage of not being easily frozen, never enough to burst the containing bottle.

The Lewis hand fire extinguisher was next investigated. This instrument consists of a tin tube about two feet long, containing 34 fluid ounces of a solution consisting of a sulphate of soda in weak caustic ammonia. From the trials made we could not notice any appreciable superiority over the salt solution, as used in the Harden grenade. It has the disadvantage of not being made to break by being thrown, but must be opened by having a cork extracted from one end of a tin tube, requiring a smart jerk. The solution is then sprinkled on the fire by the operator. The principal value of this form of extinguisher must consist in the advice to the consumer printed upon the outside of the instrument, to "keep cool—not get excited," etc., which, seeing that he holds the tin case in his hand while distributing the contents on the flames, allows him to consult and follow this most excellent advice.

A STRIKE IN ANCIENT DAYS.

When strikes are so common in Europe and America, it will be interesting to consider how the ancient Egyptians managed such a crisis in the labor question. It was supposed that strikes were an original outcome to our modern civilization; but the deciphering of a papyrus in the museum of Turin shows how the old proverb that there is nothing new under the sun applies to strikes as well as to many other things. This papyrus which is a sort of journal or day-book of the superintendent of the Thebes necropolis, furnishes curious details of a workmen's riot or disturbance in Thebes, in the twenty-ninth year of a king Ramses, who is supposed to be Ramses III. The workman's quarter sent a deputation on the 28th of December to Hatnekin, the keeper of books, and to several priests of the necropolis. The speaker of the deputation spoke as follows:

"Behold, we are face to face with famine. We have neither nourishment, nor oil nor vestments. We have no fish, we have no vegetables. We have already sent a petition to our sovereign lord the Pharaoh, praying him to give us these things, and we now address the governor, in order that he may give us wherewithal to live."

These facts took place on the 27th of December (first day of the month Tybi). The general distribution of wheat was then evidently due to the workmen, but why it did not take place is not known. Perhaps the individual who should have distributed the food was absent. Whatever was the cause of the delay, the need was urgent, and Hatnekin, with the priests present, either touched with compassion, or to prevent the affair from reaching the ears of the governor of the necropolis, accorded one day's rations. How the workmen lived in the days following is not recorded in the papyrus; but some weeks afterward they were in full revolt. Three times they forcibly emerged from their quarters notwithstanding the walls which surrounded them and the gates which closed them in. "We will not return," cried a kneftu to the police sent in pursuit of them. "Go tell your chief what we tell you; it is famine which speaks by our mouths." "To argue with them was useless. There was great agitation," wrote the superintendent in his day-book; "I gave them the strongest answer I could imagine, but their words were true and came from their hearts."

They were quieted by a distribution of half-rations, but ten days later they were up again.

Kohns, the leader of the band, pressed his companions to provide for themselves. "Let us fall," said he "upon the stores of provisions and let the governor's men go and tell him what we have done." This counsel was followed as soon as given. They entered forcibly into the inclosure, but not into the fortress where the provisions were kept. The keeper of the stores, Amen-Nextu, gave them something and contrived to induce them to return to their quarter.

Eleven days later the movement began again. The commander of Thebes, passing by, found the men seated on the ground behind the temple of Seti, at the northern end of the necropolis. Immediately they began to cry: "Famine! famine!" The commander then gave them an order for fifty measures of wheat in the name of Pharaoh, "who has sworn," said he, "an oath that you will have food again." Most likely Pharaoh never heard of the event and never received the petition addressed to him a couple of months previously.—*The Pilot.*

GRAIN ASSOCIATIONS.

Grain receivers find that they are compelled to take the grain associations into account more each year. These associations have been increasing with great rapidity, and already, as in Iowa, control the grain shipments of large areas. They regulate prices and determine the rate at which the grain is to be marketed. On the average the members of the association will receive more for their produce than the farmers and merchants who dispose of their stock independently. The objectionable feature of the grain association is that the directors must necessarily be speculators to a greater or less extent, and in determining the amount of grain to be held in reserve they really deal in futures as much as any of the operators on 'change. They sell for future delivery, and have the grain on hand with which to fill contracts. The consequences of a mistake in judgment would be very serious to the members of the association.—*St. Louis Republican.*

"How do you like apple-pie, Mr. Cross?" asked the landlady.

"Why, cut in large pieces and served with cheese," replied the level-headed boarder.

THIS YEAR'S BARLEY CROP.

In foreign barleys, the Saale growth this year is a good one, although not of extra fine quality. A fair trade is being done in Saale, and, under the circumstances, as prices have opened reasonably, it will doubtless continue. Hungarians, Moravians and Bohemians may be similarly reported on.

New Californian types show good berry and color, but are scarcely of so choice a character as usual, being coarser in skin, with almost entire absence of their characteristic bloom.

Smyrnas, Danubians and Algerians have been ruling very low, as grinding barleys are so cheap. They are all of a fair average quality, and should present prices be maintained, they will continue to command attention.

The encouraging prospects of a fine English harvest have been sadly marred by the continued wet weather, which has been so generally prevalent during the present month all over the British Islands; and in consequence we shall expect to find one-third to one-half of the English crop (according to district) more or less damaged.

The earlier districts are evidently the most favored, notably the southern, southwestern and southeastern counties; whilst the midland and eastern counties will have a more varied selection, and their quality will graduate from very fine to badly stained and much damaged samples; and in consequence maltsters and brewers will have to use considerable care in the selection of their requirements. We anticipate a wide range in prices, from very low quotations for damaged lots up to 42s. (and even higher) for perfect samples of English barley.

The Scotch and Irish reports vary somewhat, though we shall get size as usual from the former country and a larger export supply than last season from the latter (on account of increased acreage); we fear, however, that in the main the crop will be generally weathered in both countries.

The Danish barleys this season are of fairly fine quality and will command considerable attention if prices are moderate, but, in our opinion, they scarcely deserve the encomiums recently reported in a trade journal.

The French growth (especially the Sarthe and Sable districts) is a large one and has been secured in good condition. The usually favored Saumur department is this year below its customary excellence. Brittany and Normandy show a large proportion of unripe and rough samples. A lively demand already exists for the various French growths and considerable shipments of Sable and Sarthe barleys have already been made, and prices are gradually rising at the time of writing this.—*American Brewers' Gazette.*

CROP REPORT FOR NOVEMBER.

The U. S. Department of Agriculture furnishes the following report;

CORN.—The present crop of corn is the first that is a full average in rate of yield since that of 1880, which was the last in a series of six full crops, averaging 26 to 28 bufhels per acre. During most of this period of large crops of maize, there were under-average crops in England and France, causing an unprecedented deficiency in wheat and meats. This shortage, with the abundance and cheapness of grain and pork products in this country, caused an extraordinary exportation of food supplies, altogether abnormal in quantity, and not to be continued in the future. The under-medium yield of corn of the last four years has stiffened prices and reduced foreign shipments, while the increase in foreign production has made necessary a smaller demand upon our surplus.

The present crop, grown on an area between 73,000,000 and 74,000,000 acres, is the largest in absolute quantity, though not the largest in rate of yield, ever made in this country. The highest rate of yield is 36½ bushels, in Nebraska and Ohio.

BUCKWHEAT.—The buckwheat crop will be large, the average yield exceeding 14 bushels per acre, notwithstanding the fact that in a number of Western and Northwestern States this grain has suffered considerably from the August and September frosts. In a number of counties in Michigan, Wisconsin and Minnesota the injury is very serious, amounting in some cases to a practical destruction of the crop. Damage is also reported from several counties in Ohio and Indiana.

We will send the U. S. Miller and American Miller for one year for $1.50.

ABOUT THAT COMPROMISE.

COLUMBUS, O., Nov. 20, 1885.

Editor of the United States Miller, Milwaukee, Wis:

DEAR SIR.—The suit which for several years has been pending between the Consolidated Middlings Purifier Company, of Jackson, Mich., and the Case Manufacturing Company, of Columbus, O., has been settled. It will be understood that the Consolidated Company and the G. T. Smith Purifier Company are separate and distinct organizations. The Smith Company derived their rights for the manufacture of their machine from a license under the Consolidated Company. This Consolidated Company is the owner of all of the patents on purifiers of any value, except those owned and controlled by the Case Manufacturing Company. This gave them a basis to enter suit against other parties building purifiers, from time to time, and might be continued on through the courts for a number of years or until the patents had entirely run out, thus keeping the parties sued under one constant and perpetual cloud.

The reasons which led the Case Manufacturing Company to make this settlement were purely of a business nature. We believe that our interests are advanced by this settlement, besides which our customers will be protected beyond any question of doubt.

The position now occupied by the Case Manufacturing Company and the Smith Company are the same, each being licensed under the Consolidated Company.

The fund which will be derived from this license will be used by the Consolidated Company to protect themselves and their licensees.

We were also influenced to a great degree in making this settlement, by the fact that we are, ourselves, the owners of a large number of valuable patents, and a number of which are infringed upon by our competitors, and we desired to relieve ourselves from this litigation that we might employ our retained legal advisers in the vigorous prosecution of those who were appropriating our property.

Our automatic feed for rolls and purifiers is now being infringed upon and used *secretly* by a large number of mill builders of this country, and we shall immediately take action for the protection of our rights in this matter. We remain,

Very Truly Yours,

THE CASE MANUFACTURING CO.

By J. M. CASE, Vice-President.

We will send the U. S. Miller and The Milling Engineer for one year for $2.00.

A GREAT SEWER.

There is building in Washington city a sewer which is larger, by 7 feet, than any other sewer in the world. In its smallest part it is larger than the largest of the sewers of Paris. For over 2,000 feet it is a circular sewer of 22 feet in diameter. There is connected with it a sewer of 5,000 feet, or nearly 1 mile in length, of 20 feet in diameter. A fully-equipped palace-car, locomotive and all, could be run through it without difficulty. This enormous sewer is intended to drain the immense water-shed north of the city. Besides that it will carry to the eastern branch of the Potomac all the contents of the smaller systems of sewers in the northern part of the city. It will take, probably, a year to complete the work. The Boundary street sewer, with its connecting systems, will cost when completed, over $700,000. At present the excavation is made by machinery operated by steam-power, which lifts the dirt out and lands it on the completed part of the work by means of a system of cables. The same cables are also used in lowering the bricks and cement to the workmen.

ASBESTOS FOR PISTON AND VALVE ROD PACKING.—Asbestos is a substance which can readily be manufactured into ropes, etc., which cannot be changed except by a high degree of heat, and is not affected by acids or grease. These qualities, in addition to its cotton-like consistency, especially adapt it to the purpose of packing all kinds of rods and joints which are exposed to the action of steam of either a high or low temperature. As a piston or valve-rod packing, for high pressure there is nothing superior to it, if well managed. It is found on sale at most all places where engineers' supplies are kept, in the form of rope for piston and valve-rod packing, and in sheets for steam chest and pipe flange joints, When used for piston and valve-rod packing, it should be well lubricated with a compound composed of equal parts of plumbago and tallow, and when placed in the gland around the rod great care should be used that it is not screwed up too tightly. This packing, if the rod is lubricated every two or three days with the plumbago and tallow compound, will outlast any known substance for this purpose. To prepare asbestos for joints, cut to the required size, and then paint one side with red lead, and the other cover with plumbago, so that if it becomes necessary to separate the joint after being made, it can be done without injuring the packing. Steam chest joints which are so often separated for the purpose of valve inspection, when made of this material, and in this manner, will last for years without removal.

SPECIAL BUSNIESS NOTICES

FLOUR MILLS FOR SALE.

Short advertisements will be inserted under this head for One Dollar each insertion.

A three-run four foot Stones, set Porcelain Rolls, Purifiers, &c. Good location Terms easy. For full particulars address Rondebush & Co., Chehalis, Lewis Co., Wash. Ter.

SAM. L. CLARK, Lockport, Ind., 3-run water power mill. Half interest for sale, also 42 acres land for sale or rent with it.

W. B. ALCOCK & SONS, Chanute, Kansas, 50-barrel combined roller and stone mill. Steam power.

LOWELL NATIONAL BANK, Lowell, Mich., 5-run water power mill. Good location. For sale cheap and on good terms.

JNO. J. QUIGLEY, Springville, N. Y., Steam flour and feed mill. Well established trade. A rare chance to make money. Address as above.

For Sale a good water power 100-barrel Mill, using combined stone and roller system, at Preston, Minn. Good reasons given for desiring to sell. A bargain for somebody. Address for further information, B. K., care of United States Miller, Milwaukee, Wis.

For Sale a good water power 100-barrel Mill, stone system, at Aumsville, Oreg. Address M. B. C., care of United States Miller.

For Sale a 50-barrel Roller Mill. Does both Exchange and Merchant work. Good shipping facilities either by railroad or Mississippi River. Both Spring and Winter Wheat. 95 acres of land finely located can be had with the mill. Address,
J. C. SCHALLER, Brownsville, Minn.

WANTED—By a young man 21 years of age a situation in a 100 or 200 barrel Roller Mill where he could have the opportunity of learning the roller system. Is at present working in a 1500 barrel mill. Wages not so much of an object as a thorough learning of the business. Address "Milling", care of United States Miller, Milwaukee, Wis.

PARTNER WANTED in a 50-barrel steam power Roller Mill, all new and complete. My former mill was destroyed by fire and I had no insurance. I have succeeded in rebuilding a good mill, having a good custom trade. I want a partner who is a practical man with some capital to take an interest and help build up a first-class Merchant trade. Those desiring to investigate will please call or address without delay. W. H. LANE, Prop. Union Mills, Milton, Wis.

THE MILLER'S DAUGHTER.

Taking one day a quiet stroll
Beside a millstream's rippling water,
I met, upon a grassy knoll,
The miller's rare and radiant daughter.

Her face was as the sunlight, fair,
When May's blue sky the landscape blesses,
And her long waves of floating hair
Fell gently down in silken tresses.

Sweet birds were singing in the trees,
And flowers rose up in fine profusion—
Upon the fields the toying breeze
Brought happiness without confusion.

But Gertrude—'twas a pretty name—
Blushed suddenly, and feigned retreating,
When I inquired the way she came,
And asked her pardon for our meeting.

One word of kindness led along
To friendly utterance of another,
And much dissourse, coy ways, a song,
And final reference to her mother!

How strangely sweet are winsome ways,
And simple life; a sorry comer
She thought me at the trysting place—
A blot upon the sun and summer.

At length it turned far otherwise—
We took long walks beside the water;
And now I thank my lucky eyes
That there I found the miller's daughter.

NONSENSE.

KANSAS' GREAT TRADE IN FIRE EXTINGUISHERS.—I was in a little Kansas town selling some goods, and made a call at the "general store," the chief business place of the village. There were lots of countrymen coming and going there, and standing around and talking crops and horses and politics. I noticed that a good many of 'em bought these hand grenade fire extinguishers—some as many as half a dozen. That struck me as being a little curious, and so I inquired of the storekeeper.

"Oh, that's all right," he said; "they use 'em to put out prairie fires with."

That didn't satisfy me, and so I tackled a farmer on the sidewalk and asked him what he was going to do with the hand grenades.

"I am buying these to put in our school house," he said.

Thinks I, that's a little funny; and so I made inquiry of an old chap whom I had met on a former trip, and knew to be a deacon in the church, and a shining light in his community.

"Well," he says, in response to my inquiry, but a little confused like, "we thought it would be a good idea to have some in our meetin' house in case of fire."

Just then I stepped around to the back end of the store to see a new thrashing machine, and, would you believe it? there between two big corncribs, was a countryman with one of those fire extinguishers up to his mouth and drinking out of it!

"Great heavens, man," I exclaimed, "that will kill you!"

"That's all right stranger," he replied, with garin, "you kin have yer little joke if you want to; but I 'spect you come out after a snifter. The Prohibitionists are right smart strict in this town, ye know. Try a little of the gin, eh?"—*Chicago Herald.*

"THE corn crop of the United States will be an immense one this year," remarked a grain broker to a customer this morning.

"Hominy bushels?" queried the customer.

"About one and a half billion."

"A-maize-ing."

"Yes, it will add to our property, greatly."

"Undoubtedly; I can ce-real wealth in this crop."

Then the broker got tired, and his corn's talk ceased.—*Pittsburg Chronicle.*

A MILWAUKEE factory is constantly engaged in making axles for baby carriages. The average Milwaukeean can't keep house without one or two baby carriages.

"How does the new pastor impress you, Miss Spinster?"

"Law sakes, how did you know he impressed me at all? I didn't 'spose anybody saw us."

A DRUNKEN parishioner was admonished by his parson. "I can go into the village," concluded the latter, "and come home again without getting drunk."

"Ah! meenster, but I'm sae popular," was the apologetic reply.

A PHILANTHROPIC lady saw a couple of urchins pulling each other's hair, and separating the combatants, she proceeded to lecture them kindly on the evils of fighting. Both boys seemed truly penitent, and before leaving them the lady said: "You wouldn't pull Billy's hair now, would you, Johnny?"

"N-no mum," faltered Johnny.

"And you won't pull Johnny's hair again, will you, Billy?"

"No, mam," replied Billy, "But I—I'll—"

"That's right, Billy. You would rather kiss him, wouldn't you?"

"No, sir; I wouldn't! I'd rather break his durn back."

WEAKNESSES OF GREAT MEN.—Alexander was too fond of strong drink.

Julius Cæsar was inordinately vain and fond of dress.

Demosthenes was always on the platform when everything was serene, and under it when there was danger.

Peter the Great was a glutton and a drunkard.

Napoleon was addicted to lying; so much so that the habit became notorious.

The Earl of Chatham always dressed and posed for effect.

Sheridan was never able to give up the bottle and the gaming table.

George Washington occasionally swore when he was very mad.

Gen. Santa Anna had a weakness for cockfighting.

Disraeli started out a dandy and remained one to the last.

Alexander Dumas earned millions with his pen, but could not keep out of debt.

MR. FINN, a comic actor of Boston, in 1832, on the occasion of his benefit, said:

Like a *grate full* of coals I glow,
A *great ful!* house to see,
And if I am not *grateful* now,
A *great fool* I would be.

On another occasion he said:

If I were *punished*
For every *pun I shed*,
I would not have a *puny shed*
To cover my *punnish head*.

Moseby, who has been away from town for some time, returned the other day. Shortly afterward a friend met him and, noticing his seedy and low-spirited appearance, asked:

"Moseby, what's the matter, old fellow?

"Ruined."

"What?"

"A financial wreck."

"How did it occur?"

"Well, you see, I had charge of a bridge not far from here. The owners of the bridge are very particular about receiving every cent that is due them, so they put in one of those registers. It is a sort of fool arrangement, sunk in the foot passageway of the bridge and makes a mark with a clicking punch every time anybody steps on it. Well, everything was all right until the other day. A big Newfoundland dog got on the blamed thing and began to scratch himself and, sir, before I noticed him he had charged me up with $275. Yes, I am a ruined man."

TWO KICKERS.—Just my luck, he groaned as he came down stairs.

Lost anything?

Everything. I wanted Brown, on the third floor, to sign a note with me. When I got to the second landing, I met a dog coming down.

And you raised your hat?

Alas, no. I raised my foot.

And it was Brown's dog?

It was, and he was looking over the railing.

Why didn't you plead ignorance?

I did, and so did Brown. Hanged if he didn't kick me three times and then pretend to find out who I was. Under the circumstances I couldn't ask him to sign, you see.

The stingiest man on record is an Indianian. He walked out to the cemetery and died to save funeral expenses.—*Kentucky State Journal.* Had he been a Kentuckian, he would have bought a horse on credit, sah, and went to his repose in b'gad style, sah.—*Hoosier Bangwhang.*

Mr. A.—"So I see, Jeanne, that Miss Blow is to be married. Nice little thing, too; used to be in love with me."

Mrs. A.—"Now, John, you know that isn't so."

Mr. A.—"Anyway, she bought one of my pictures."

Mrs. A.—"Then I give in. She must have been awfully in love with you."

She—Ephlum, what makes so many cattails grow in dis heah pon' ?"

He—Well, I should say! Doan you know? Why, de grows up from kittens that people hez drowned in de pon', of course. Pea's like you wimmen folks doan know nuffin 'bout aglicultshah.

The man who mortgages his property, while the money lasts lives on the fat of the land, while the man who loans the cash has to be content with the lien.

A HOME-MADE TELEPHONE.—To make a serviceable telephone, from one farm-house to another, only requires enough wire and two cigar boxes. First select your boxes, and make a hole about half an inch in diameter in the center of the bottom of each, and then place one in each of the houses you wish to connect; then get five pounds of common iron stove-pipe wire, make a loop in one end and put it through the hole in your cigar box and fasten it with a nail; then draw it tight to the other box, supporting it when necessary with a stout cord. You can easily run your line into the house by boring a hole through the glass. Support your boxes with slats nailed across the window, and your telephone is complete. The writer has one that is two hundred yards long and cost 45 cents that will carry music when the organ is playing thirty feet away in another room.

UNITED STATES MILLER.

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MILWAUKEE, DECEMBER, 1885.

ANNOUNCEMENT:

☞WM. DUNHAM, *Editor of "The Miller," 69 Mark Lane, and* HENRY F. GILLIG & Co., *449 Strand, London, England, are authorized to receive subscriptions for the* UNITED STATES MILLER.

We send out monthly a large number of sample copies of the UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. Send us One Dollar in money or stamps, and we will send THE UNITED STATES MILLER to you for one year. SEE COMBINATION OFFER ON OTHER PAGES.

☞*The United States Consuls in various parts of the world who receive this paper, will please oblige the publishers and manufacturers advertising therein, by placing it in their offices, where it can be seen by those parties seeking such information as it may contain. We shall be highly gratified to receive communications for publication from Consuls or Consular Agents everywhere, and we believe that such letters will be read with interest, and will be highly appreciated.*

TO ADVERTISERS.

Milwaukee, Wis., Dec. 1, 1885,

To Those Interested in the Flouring Trade:

THE UNITED STATES MILLER is now in its tenth year, and is a thoroughly established and much valued trade paper. It has a large regular list of domestic and foreign subscribers. It is sent monthly to United States Consuls in foreign countries, to be filed in their offices for inspection by visitors. It is on file with the Secretaries of American and European Boards of Trade for inspection of members. Aside from the above, thousands of SAMPLE COPIES are sent out every month to flour mill owners who are not subscribers, for the purpose of inducing them to become regular subscribers, and for the benefit of those advertising in our columns. Every copy is mailed in a separate wrapper. Our editions have not been at any time since January, 1882, less than 5,100 COPIES each, and are frequently in excessof that. We honestly believe that the advertising columns of the UNITED STATES MILLER will bring you greater returns in proportion to the amount of money invested than any other milling paper published. Advertisers that have tried our paper for even a few months have invariably expressed themselves well satisfied with the results. Our advertising rates are reasonable. Send for estimates, stating space needed. The subscription price of the paper with premium is One Dollar per year. Sample copy sent free when requested. We respectfully invite you to favor us with your patronage. We shall be pleased to receive copies of your catalogues, and also trades items for publication free of charge. Trusting that we may soon be favored with your orders, we are,

Yours truly,
UNITED STATES MILLER.
E. HARRISON CAWKER, *Publisher.*

Affidavit Concerning Circulation.

STATE OF WISCONSIN, } ss.
MILWAUKEE COUNTY. }

E. HARRISON CAWKER, editor and publisher of the *United States Miller*, a paper published in the interest of the FLOURING INDUSTRY, at No. 124 Grand Avenue, in the City of Milwaukee, and State of Wisconsin, being duly sworn, deposes and says that the circulation of said paper has at no time since January, 1880, been less than FIVE THOUSAND (5,000) copies per month; further, that it is his intention that it shall not in the future be less than FIVE THOUSAND copies each and every month.

Sworn to and Subscribed before me at Milwaukee, Wis., this 25th day of November, A. D. 1885.

E. HARRISON CAWKER,
Publisher.
G. McWHORTER,
Justice of the Peace.

WE wish all our readers a MERRY CHRISTMAS and a HAPPY NEW YEAR.

IT has been determined to slightly increase the charges for grain inspection in Chicago.

IT is reported that Lord Provost Ure, of Glasgow, Scotland, will soon build another flouring mill, to have a capacity of 6,000 to 7,000 sacks of 280 lb. each per week.

We will send the U. S. Miller for one year and Ropp's Calculator for $1.00.

W. F. GUNN and others have organized a company called The Roller Mill Furnishing Co., with office at 22 Boston Block, Minneapolis, Minn. Mr. Gunn is the general manager.

Dr. Cowan's "Science of a New Life" should be read by every man twenty-one years of age. It is a scientific work in plain language that anyone can understand. See descriptive advertisement on another page.

WE tender our most sincere thanks to Messrs. Horace Davis & Co., of San Francisco, for the very complete report they have sent us of capacity, etc., of California flouring mills, for publication in Cawker's Flour Mill Directory for 1886.

MOST of the Minneapolis flouring mills have shut down, it is presumed, for the balance of the year, unless some especially favorable turn in the market gives them good reasons for starting up again. Large quantities of wheat are being shipped to Duluth and Chicago and consequently the wheat trade is demoralized.

OUR readers may look for some interesting developments in milling machinery by parties in Cleveland, O., before the new year is very old. A middlings purifier of novel construction is one of the machines to be placed on the market.

We will send the U. S. Miller for one year and Ogilvie's Handy Book for $1.00.

THE *Millstone* appears to take great interest in the affairs of the Millers' National Association and has considerable to say about the officers holding over, instead of calling a convention and electing officers. The Millers' National Association is really a private affair and we do not know what business the *Millstone* or any other paper has to "stick its nose" into its affairs. If the members of the association do not protest against the action of the sub-executive committee—if, in short, they are perfectly satisfied (and they seem to be), we do not know of any good reason why any outsider should interfere. There is nothing of patriotism about the association—it is organized for business and, evidently, the officers have attended to that well.

Before subscribing for any paper read the U. S. Miller club list on another page.

A BILL was filed in the Chancery Court at Richmond, Va., by A. Y. Stokes and George Wallen, for themselves and other creditors of the Gallego Mills Manufacturing Company, praying for the appointment of a receiver. The aggregate liabilities of the company are placed at $676,400. Judge Holladay appointed Thos. Polk, of the firm of Stokes & Co., receiver, to take charge of the property and operate the mills subject to the orders of the court. The Gallego mills are among the oldest in the country, the original plant being made nearly 100 years ago. The mills have been destroyed by fire several times, the last time being at the evacuation of Richmond. They soon rebuilt on a scale of greater magnitude than ever. The entire property probably is now worth over a million of dollars. The Gallego mills have a capacity of 1,000 barrels per day and have manufactured principally for Southern and West Indian trade.

Millers should make themselves "solid" with the milling papers by sending in their subscriptions now.

MILWAUKEE NOTES.

JOHN B. CROMWELL, engineer of the Phœnix Mills, has gone to Mobile, Ala., with his family to spend the winter.

HERMAN NUNNEMACHER, ESQ., has sold the "Star Flour Mills" to Messrs. A. Kraus & Co., of this city. The machinery will be taken out, we are informed, and the building used for other purposes. By this Milwaukee loses a large flouring mill.

ALL the Milwaukee mill furnishers report business good, and judging from visible shipments of milling machinery, we believe the report to be entirely correct.

For $5.00 we will send Gibson's recent work on Gradual Reduction Milling, The Northwestern Miller and U. S. Miller for one year.

WE have the pleasure to announce that we will issue Cawker's Ameridan Flour Mill, and Mill Furnishers Directory for 1886 about Feb. 1, 1886. We desire all who wish copies to send in their orders now, as only a very limited edition will be printed. The work will be issued in first-class style, and the publisher will use his best endeavors to make it perfect. All communications in reference to it should be addressed to E. Harrison Cawker, publisher UNITED STATES MILLER, Milwaukee, Wis.

We will send Harper's Weekly and the U. S. Miller for one year for $4.10.

ABOUT eight years ago the Georgia State Agricultural Department received from Egypt a collection of African seeds, which were distributed among Georgia farmers. Included in the lot were seeds of the Kaffir corn, so called because it is the principal food of the Kaffirs of South Africa. A little of this has been cultivated every year by Dr. J. H. Watkins, of Campbell County, who found it to be excellent for forage. This year he planted an acre of it on the poorest land he had, which would not have yielded three bushels of wheat. Without any fertilizer, however, the Kaffir corn yielded thirteen bushels. He had some of it ground into flour and made into bread. The flour was fine and had a rich creamy color. It was made

into biscuits, egg-bread and cakes, and in each form it proved delicious. Except in color it was impossible to distinguish it from the finest Ohio Valley flour. Specimens of the bread and cake distributed at the Department of Agriculture excited surprise by their excellence. The cultivation of Kaffir corn is likely to become large in Georgia.

NEWS.

DIED—William Gardner, miller, at Ozark, Mo.

G. J. Wuerth & Co., Holton, Ks., have sold their mill.

BURNED—Muntz & Cassidy's grist mill and gin at Greenville, Tex.

Otto Puhlman, miller, at Plymouth, Wis., has made an assignment.

The Government saw and grist mill at Keshena, Wis., cost $4,000.

Henry Darnell's mill at Masonville, N. J., recently lost his mill by fire.

R. E. Robert's mill and elevator at Arlington, Neb., has been destroyed by fire.

J. D. James & Co., millers, New London, Mo., have sold out to J. W. Emison & Co.

A 100 barrel roller mill is being built for J. H. Baldwin, at Lewis, Ia., by a Des Moines firm.

Wm. Mitchell's feed mill in Detroit, Mich., was recently damaged by fire to the extent of $4,000.

Hale Bros.' grist mill, of Lyons, Mich., is now running day and night, and yet is behind orders.

Anton Gonnia stumbled against a shaft in the mill at Little Suamico and was whirled to death.

The Trinidad Mercantile and Milling Co., Trinidad, Colo., has been incorporated, with a capital of $50,000.

C. W. Callender & Co.'s mill, Greencastle, Ind., is burned out. Insured. Will probably rebuild immediately.

McCally & Son, of Walla Walla, Wash. Ter., are rebuilding their mill destroyed by fire some time ago.

A. S. Marble's mill at Vancouver, W. T., burned recently. Loss, $8,000. Insurance, $4,500. Will rebuild.

The "National" mill in Minneapolis has been purchased by T. W. Lyons & Co., and the name of it changed to "Victoria."

Messrs. Mattingly & Son are now building a cornmeal mill at Vicksburg, Miss., which will have a capacity of 300 barrels per day.

The Star Mill Company, of Huntingburg, Ind., has been incorporated under the style of the Star Milling Company, with a capital stock of $18,000, and will manufacture flour and meal.

The Red Cloud Milling Company has completed the building for their large mill at Red Cloud, Neb. Most of the machinery has arrived, and the mill is expected to be in operation in about a month.

Messrs. Bliss & Wood, proprietors of the Winfield Roller Mills at Winfield, Ks., write us that their flour took the first premium for roller process at the World's Fair, at New Orleans, for 1884.

J. H. Arnold & Son, manufacturers of mill picks and edge tools, at Lyons, Mich., are now running their factory fifteen hours. The firm does business in sixteen states, making shipments as far East as Vermont, and as far West as Colorado.

The Farmer Roller Mill Co., Grand Rapids, Mich., is arranging to put sixty incandescent electric lights in its works, and is building a dynamo for that purpose and an engine to drive the same. The officers of the corporation report good sales on the Farmer roll, especially in the East and Southwest.

Tanner, Sherman & Stark, proprietors of the Morning Star mills at Otter Lake, Mich., have just added to their machinery one Wilford & Northway's first break, one Wilford & Northway's centrifugal scalper and one double set of Wilford & Northway's 6x20 smooth rolls, enabling them to make four different grades of flour.

A dispatch from Chicago, dated Nov. 13, says: A jury in Judge Collins' court today gave W. G. Rainey, the lawyer, a verdict of $5,135.15 against Robert L. Downton, of St. Louis, the patentee of a flour roller. The amount was for a claim for solicitor's fees in conducting a patent suit against E. P. Allis, of Milwaukee. Downton claimed to have paid Rainey all his services were worth, and, as the suit went against him, objected to paying more.

Messrs. Marx & Kemper, of Galveston, Tex., recently bought the new roller flouring mill of Estes & Porter at that place, which already has a capacity of 150 barrels a day. The new proprietors have set to work to double the capacity and make other large and expensive improvements. This firm controls a large foreign trade, and it is supposed they now intend to export Texas flour, which is the best in the United States for transportation over the seas. It has been proved to remain sweet an indefinite time, even in tropical regions.

A member of the Montreal syndicate that controls the purchase of wheat along the Canadian Pacific says prices along the line are about sixty-five to seventy cents per bushel for No. 1 hard; being a great deal better price than at this time last year. There is some very excellent wheat this year and some of the frozen wheat is turning out remarkably well. There will be about 4,000,000 bushels for export. In some places the farmers are holding their wheat, but this is mainly owing to the fact that they are busy plowing and threshing, and just as soon as they are through they will be anxious to dispose of their grain.

At Hopkinsville, Ky., Nov. 13, a boiler in the Crescent mill exploded with terrific effect, demolishing the boiler room, killing three men, and dangerously wounding two others. John Breining, the head miller, of Detroit, Mich., was scalded to death, the flesh peeling off him in strips, presenting a horrible spectacle. Wilson Metcalf, fireman, was torn almost to pieces, his head being blown from his body. George Warling, aged 14, was the third victim, his face being battered into a shapeless mass, and terribly scalded. Frank Warling, his father, was struck on the head by a piece of the boiler, the rest going over his head, and escaped death only by a miracle. Henry Jones was also scalded. F. J. Brownell, the owner of the mill, escaped unhurt. Breining, the miller, only arrived from Michigan a week ago. The loss on the mill is $15,000. No cause is assigned for the explosion.

The following are among the many orders received by the Case Manufacturing Co., Columbus, O., since our last issue: From A. L. Strang & Co., Omaha, Neb., for 4 pairs of rolls and single purifier to be placed in the mill of A. J. Hathaway, Castana, Ia.; from D. E. Conly, Dundee, Wis , for rolls; from Montague & Co., Chattanooga, Tenn., for an additional improved centrifugal reel; from Brandt & Manning, Mount Joy, Pa., for 4 pairs of rolls, one centrifugal reel and other machinery; from A. L. Strang & Co., Omaha, Neb., for 10 pairs of rolls, one 6-reel bolting chest and one No. 1 single purifier, to be used in a mill now being built by them at Stanton, Neb.; an additional order from Johnson & Long, Eldorado, Kan., for 2 improved centrifugal reels; from P. H. Rhynard, St. Henry, O., for one improved centrifugal reel; from Vance Graham, Camden, Ind., for one No. 1 single purifier; from A. L. Strang & Co., Omaha, Neb., for 10 pairs of rolls with patent automatic feed, two 4-reel and one 2-reel bolting chests, 3 No. 1 single purifiers and one 5-reel scalping chest; from W. T. Pyne, Louisville, Ky., for 4 pairs of rolls with patent automatic feed to be shipped to W. D. Straw, Jeffersonville, Ind.; from Bunting Bros., Richmond, Ind., for 6 pairs of rolls with patent automatic feed, one 5-reel scalping chest, and one improved centrifugal reel; from A. H. Fairchild & Son, North Bloomfield, N. Y., for one No. 1 double purifier to be shipped to E. Light, Avon, N. Y.; from J. D. Wilsey & Co., Caro, Mich., for a full line of rolls, centrifugal reels, bolting chests, scalping reels, etc., for a full roller mill on the Case system, 12 pairs of rolls with patent automatic feed will be used; from W. P. Hambaugh & Co., Ringgold, Tenn., for 2 pairs of rolls with patent automatic feed to be placed in the mill of W. H. Burgess, Clarksville, Tenn.; from Dehner & Wuerpel Mill Building Co., St. Louis, Mo., for 8 pairs of rolls with patent automatic feed and one No. 2 single purifier; from A. L. Strang & Co., Omaha, Neb., for 8 pairs of rolls with patent automatic feed, one 4-reel bolting chest, and one 3-reel scalping chest for the mill they are building at Thayer, Neb.; from Roots & Co., Cincinnati, O., for 2 pairs of rolls with patent automatic feed; from A. L. Strang & Co., Omaha, Neb., for one 4-reel bolting chest.

HUSBAND—The census-taker was in, dear. He demanded the age of each of the family, and I was obliged to give him yours. He said it was the law.

Wife (enraged)—Law! What do I care for law? John Smith, did you tell that man my age?

Husband (hurriedly)—Yes, I told him you were 23.

Wife (mollified)—Well, I suppose the law has got to be respected.—*N. Y. Sun.*

THE DUTIES OF AN ENGINEER.

THE REMARKS OF MR. J. G. BRIGGS BEFORE THE ASSOCIATION OF STATIONARY ENGINEERS AT TERRE HAUTE.

Mr. President and Members of the Stationary Engineers' Association of Terre Haute: It was with much pleasure that I learned that this Association had been organized. I am confident that it will be beneficial to yourselves, to your employers and to the public generally. "Advancement and improvements" is the watchword of the present age, and in no way can persons gain more practical information than by an interchange of ideas and experiences as developed by discussion and argument with others in the same line of business. Each man does not have to depend upon his own individual resources alone. He has the right to ask questions of the ones best qualified to give him information, and get them correctly answered; for in an association of this sort there should be no reserve on that point. Since receiving the invitation of your president, I have noted down what I consider to be the qualifications and duties of a first-class stationary engineer.

The first qualification of an engineer is to be a sober man. (Sobriety, like charity and night, covers many a failing.) He should never when on duty, or liable to be called on duty, indulge in any intoxicating drinks, for whisky is a very uncertain article. There are times when a man can perhaps imbibe to an almost unlimited extent, and at others—probably owing to the state of the system at the time—a very slight amount will affect him seriously, and render him unsafe as an engineer to be intrusted with the lives and property of others. So the best way is to leave it alone. Next to this, the first qualification is a knowledge of steam. Although the more a man knows, the better it is for him, it is not in a practical sense necessary that he should be familiar with all its chemical properties, its philosophical details, etc. But he should know how to generate steam to the best advantage, with the boilers and fuel he has to use. Too many engineers who are very particular about the engine and engine-room, keeping everything in splendid order, are apt to consider the boilers beneath their dignity, and if they give the fronts a coat of asphaltum occasionally, think they have done their duty in that department, never stopping to think or care that, behind that fair exterior, danger in the shape of a defective boiler is lurking, which may prove as serious as a premature discharge of the dynamite-lined mines under Hell Gate in New York harbor. I will admit it is a little rough to have to crawl into and under the boilers, getting all covered with mud and soot, especially about the time he expects his best girl is coming to call on him. But it will pay—even if the girl goes back on him. Gentlemen, the boiler is the important factor in steam machinery. It is the life of the whole plant. You cannot turn a wheel without steam, and you cannot make steam without good boilers well managed. With a defect in either of these points, the valuable, high-priced engine is not a success. An engineer should know if there is anything radically wrong about them (either in regard to safety or economy), and if beyond his power to remedy, report the same promptly to his employer. And an experienced engineer who will run a boiler, which he considers unsafe, should be dismissed from his position and expelled from this Association. Gentlemen, if I were asked what is the objective point for an engineer, my reply would be, "To do the most work with the least fuel," and the better everything is kept in order, the nearer you will be to this ultimatum. With all due respect to scientific management in the engine-room (of which I will speak hereafter), I assure you that with an engine in fair order a large saving can be made in the boiler-room. The engineer (other things being equal) who can save one fourth of one per cent. in fuel per barrel of flour, will always be in demand at the best wages paid; now, that one fourth of one per cent. (and more) can often be easily saved by careful and intelligent firing, or by some alteration in the arrangement of the flues. There are many ways in which this can be done. To put in a familiar form to us all, we will suppose a first-class engineer takes charge of the engines in a flouring mill, where he and the proprietors are entire strangers. We will suppose it is a first class mill and the machinery runs light. The first thing he does, after taking a general survey of his new domain and finding there are no holes in his boilers that a cat could crawl through, that his engine has got a cylinder, cross-head, crank and fly-wheel, is to trace out his feed pipes. Next, to investigate his boiler-feeder. He knows (as I said before) that the boilers are the life of the plant, and that they must have water, right straight along, without any monkeying either. There should be nothing fancy about a feed pump. It should have a plain, simple valve motion, not liable to get out of order, and one which, in case of any trouble, could be easily overhauled and adjusted, and the first duty of an engineer is to keep that pump in order.

Gentlemen (to digress a little), I don't know a man who is more to be pitied than an engineer who has to depend upon one of those complicated boiler-feeders, with small, intricate steam passages, that semi-occasionally take the "studs," and refuses to work. It is no use to get mad at them, however badly you may want to. All you can do is to shut down the mill and go to tinkering. After taking the thing (I can find no other name for it) to pieces several times, running wires into numerous little holes, your work cheered by the appearance of your employer every few minutes, inquiring, in the peculiarly dulcet tones appropriate for the occasion, "What is the matter? Can't you get the thing to work? We are losing four dollars an hour by stopping,"—it may take a notion to start and run along all right, apparently contented with the trouble it has made.

Well, after setting out his packing a little, looking at his valves, screwing down foundation bolts and finding everything apparently all right, he cleans his boilers, fills them and gets up steam. The first week he has about all he can do to get the hang of the concern, and he don't get the "hang of it" by sitting down on a three-legged stool, smoking "two-fers" and playing checkers. Not much! He is here, there and everywhere. In early youth he heard the aphorism of old John Wesley, "Cleanliness is next to godliness," and adopted it as one of the tenets of his faith (as every engineer should do), knowing that in satisfaction to himself and others he will be amply repaid for his extra trouble. With him, cleanliness does not only refer to brass and bright work, but the floor, windows and boiler-room. He solders up old drip cans, makes new ones, scours off spots of rust and gets signs painted—"Positively dogs not allowed in this building." Presently the proprietor tells him that it costs too much for fuel, that a similar mill in Macksville, or perhaps Oshkosh, makes a barrel of flour with two shovelfuls less coal. That won't do. Professional pride and interest are both enlisted in the attempt to ascertain the cause of such a discrepancy. He examines and makes experiments. He may find the bridge-wall too high, or too low, for a good draft. The grate surface may be too large or it may be too small. There may not be space enough between the bars to furnish sufficient air for perfect combustion. There are many cases of that kind. In one particular instance in this city, by merely changing grate bars they were enabled to keep up steam, with common slack coal, easier than they formerly did with lump. In the setting of boilers, there is a large field for experiments. The laws which govern draft are almost inscrutable, whatever scientists may endeavor to demonstrate on the subject.

Why? I don't know, only such was the fact.

To illustrate. I know two boats on the Mississippi river, apparently built exactly alike as to hull, machinery, and boilers; and still, while one of them worked best with an open throat, on the other, to get any draft, the bridge-wall had to be built within four inches of the boiler. To return to our friend again. By this time he has ascertained, by observation, the exact height to carry the water; for there is such a point, as you all well know, varying in different boilers. He sees that his flues are well swept, or blown out; that the coal is thrown in regularly and evenly, and the fire kept to the thickness which experience on those particular boilers demonstrates to be the best. He examines the uptake to see that there is no undue proportion of gases passing off unburned, or that not too much heat escapes. He examines his boilers often, to see if there are any leaks. If any show themselves, he has them promptly stopped; and one thing, I assure you, he does not neglect to see that the boilers are thoroughly cleaned inside; for he knows that a very light scale will make from ten to twenty-five per cent. difference in the fuel used. A good, clean boiler, a good draft and good firing, are nine-tenths of the battle. He may also find that the fuel he is using is not the best adapted to the conditions, as the spiritualists say. He may find that the light, cheap coal has not the requisite strength for the work required, and that it would be economy to use a better grade, even at a higher cost; or, he may find that by some alterations, he can use common slack in the place of lump. An engineer should know which is the most economical fuel to which he has access; and it is no more than right that the proprietor should defer to his judgment, if he considers him a competent man. If not, he should get one who is; and an engineer should be sufficiently competent to have the suggestion for improvements come from him, instead of from the office. He may run against a snag, not so easily got

(CONTINUED ON PAGE 54.)

—OFFICE OF—

CAWKER'S AMERICAN FLOUR MILL AND MILL FURNISHERS' DIRECTORY

—AND OF—

THE UNITED STATES MILLER,

124 GRAND AVENUE,

MILWAUKEE, WISCONSIN.

GENTLEMEN:—It is the duty of business men to use all honorable means in their power to secure business. We therefore suppose that all millers, whether proprietors of large or small mills, will be glad to adopt such means as will be likely to bring increase to their business. We desire to state that in January, 1886, we shall go to press with ***CAWKER'S AMERICAN FLOUR MILL AND MILL FURNISHERS' DIRECTORY.*** It is desirable that this work shall contain the name of every person or firm in the United States and Canada owning a flour mill, together with correct post office address, capacity of mill in barrels of flour *per day of twenty-four hours*, and the kind of power used to run the mill, whether steam or water, whether stones or rolls or both are used, etc. Is it not worth your while to sit down and write us, giving these particulars? We think it is, and will tell you why. This Directory is purchased and used by wholesale flour dealers in the large cities in this country: east, west and south; by flour exporters; by European flour importers; by railway, lake and ocean transportation companies, insurance companies, by mill furnishers and all manner of dealers in machinery and supplies used in and about flouring mills; in short, by every class of business men in all parts of the United States, Canada and Europe, desiring to transact business with American millers. Is it not worth your while to be properly represented in a book looked upon as *authority* by these classes of people that have business to transact with you? We assure you that you will find yourself more than repaid for the small amount of time and expense incurred in sending us these particulars by the information you will receive through the many circulars, journals, market reports, etc., sent you by the users of this Directory, giving you *free* an insight of the general business being done in your line of trade throughout the world.

Previous to the year 1876, no such work was published, but the undersigned, who was then as now, engaged in the publication of the *United States Miller*, having received so many letters from parties all over the country asking for addresses and information of a general character about millers, conceived the idea that there was a demand for a work of this class, and consequently, in the year 1876, prepared the first Milling Directory ever published. This was followed by corrected and enlarged issues in the years 1878, 1880, 1882 and 1884. The last (1884) was the most complete and perfect book we could possibly get up at the time and has given great satisfaction, but it was not as complete in detail as we could wish, for out of 26,000 millers to whom we sent circulars but about 11,000 replied. *They were either too lazy, negligent or thoughtless to look after their own interests.* Now that we have explained the matter in full to you, we trust you will answer our questions promptly. We further desire to ask in all modesty, that considering the fact that we have fathered this enterprise and assumed a considerable pecuniary responsibility that you will subscribe for our paper (*The United States Miller*, price $1.00 yer year). The paper is well worth the price and we believe we deserve the encouragement your subscription will give us.

Should you wish your name or name of your firm inserted in **full-faced type,** in the Flour Mill Directory, we will send you the U. S. Miller for one year and your name so displayed for $2.00. The following will illustrate: Supposing John Brown & Co., of Minneapolis, Minn., write us that they have a mill driven by steam and water power, using both stones and rolls and having a capacity of 500 barrels of flour in twenty-four hours, this is the way it would appear in the Directory, *not displayed*:

○●*†500 John Brown & Co., Minneapolis, Minn.,

or displayed:

○●*†500 **John Brown & Co.,** Minneapolis, Minn.

The first sign used means, stones—the next, rolls—the star, water-power—the dagger, steam-power; the figures, number of barrels of flour the mill can make in twenty-four hours. By having your name displayed as above, it will attract especial attention, which will certainly prove of benefit to you.

Now, gentlemen, in conclusion, we beg you to answer our questions at once. Subscribe if you please—display your name if you please and *help a valuable business accessory along*, but at all events send us the information asked for. Address

E. HARRISON CAWKER,

Publisher UNITED STATES MILLER, Milwaukee, Wis.

What is the name of proprietor, or firm?

Name ..... Post Office .....

County ..... State .....

Do you use water or steam power? .....

How many barrels of wheat flour can your mill make in 24 hours if you run up to full capacity? .....

Do you use the Roller or Stone system, or both? .....

Do you make an important specialty of making rye flour, corn-meal, oat-meal, buckwheat, or hominy? .....

Please enclose your business card and oblige us with the names of all mill owners who receive their mail at your post-office, and give us any information that will tend to make our work perfect.

If by chance this should be addressed to anyone *not in the flour milling business*, oblige us and the trade by dropping us a postal card saying that you are not in the business.

[OVER.]

FILL OUT THIS BLANK PLAINLY AND SEND IT

With the proper amount of money, addressed to E. HARRISON CAWKER, Publisher, No. 124 Grand Avenue, Milwaukee, Wis. Read our Combination offer below, carefully.

Publisher UNITED STATES MILLER:

Enclosed find $..... for which send the UNITED STATES MILLER

for ..... year ..... and .....

(Insert here Name of any other Papers or Books desired.)

.....

.....

Address ..... *Name.*

..... *Post Office.*

..... *County.*

..... *State.*

THE UNITED STATES MILLER SHOULD BE KEPT IN EVERY OFFICE HAVING ANY INTEREST IN THE MILLING INDUSTRY.

For One Dollar, we will send THE UNITED STATES MILLER for one year and ONE copy, postpaid, of either of the following useful and entertaining books, viz: ***Ropp's Calculator; Ogilvie's Popular Reading; Ogilvie's Handy Book of Useful Information; Fifty Complete Stories by Famous Authors; The Great Empire City, or High and Low Life in New York.***

For $1.60 will send the UNITED STATES MILLER for one year and ***Webster's Practical Dictionary,*** or for $2.25 will send the paper for two years and the ***Dictionary.***—For $2.75 will send the UNITED STATES MILLER for one year and ***Moore's Universal Assistant and Complete Mechanic.***—For $3.25 will send the UNITED STATES MILLER for one year and Dr. Cowan's ***Science of a New Life,*** a very valuable book which every married man and woman should read.—For $1.50 will send the UNITED STATES MILLER for one year and ***"Everybody's Paint Book"***, recently published.—For $1.25 we will send the UNITED STATES MILLER for one year and ***"The Fireman's Guide, a Handbook on the Care of Boilers."*** In the following list, the figures to the left of the name of each paper indicate the regular subscription price of that paper, and the figure to the right, the combination price for the UNITED STATES MILLER for One Year and the paper specified.

CLUB LIST. THE UNITED STATES MILLER, WITH

Subscription price of each paper named below:	ONE YEAR.
$2.00 Northwestern Miller	$2.50
1.00 American Miller	1.50
1.50 London Miller	2.50
1.00 Millstone	1.50
1.00 Modern Miller	1.50
4.00 Hints on Mill Building(book)	4.00
3.20 Scientific American	3.50
1.50 American Agriculturalist	2.00
4.00 Harper's Magazine	4.20
4.00 Century Magazine	4.60
2.50 American Machinist	3.20
1.00 Millwright and Engineer	1.50
1.00 Deutsch-Amerikanische Mueller	1.50

Subscription price of each paper named below:	ONE YEAR.
$1.25 Chicago Weekly Times	$2.10
1.00 Chicago Weekly Tribune	2.00
5.00 Turf, Field and Farm	5.50
1.00 Miller Journal	1.50
1.00 St. Louis Globe Democrat	2.00
1.00 Boston Globe Democrat	2.00
5.00 Bradstreet's	5.50
4.00 Frank Leslie's Chimney Corner	4.25
3.00 Frank Leslie's Illustrated News Paper	4.25
2.50 Frank Leslie's Popular Monthly	3.15
4.50 Harper's Weekly	4.10
4.00 Harper's Bazar	4.10
2.00 Harper's Young People	2.75

Subscription price of each paper named below:	ONE YEAR.
$1.00 Inter-Ocean, Chicago	$2.00
2.00 Mechanical Engineer	2.50
1.00 Mechanical News	2.00
1.50 Milling World, (Weekly)	2.00
1.00 Miller's Review, (with flour trier)	1.75
3.00 New York Weekly	3.25
1.00 Post-Dispatch, (St. Louis)	2.00
3.00 St. Nicholas	3.60
1.00 Milwaukee Sentinel	2.00
1.00 New York Sun	2.00
1.00 New York World	2.00

WE WILL GIVE CORRESPONDINGLY LOW RATES ON ANY OTHER PUBLICATION THE SUBSCRIBER MAY DESIRE.

ADDRESS,

E. HARRISON CAWKER,

Publisher United States Miller, No. 124 Grand Ave., Milwaukee, Wis.

N. B.—In writing for advertising rates, please state amount of space desired and length of time advertisement is to run.

☞Mill For Sale or For Rent Ads., $1.00 per insertion. Situation Wanted Ads., 50 cents per insertion.

[OVER.]

CORNMEAL MADE BY ROLLERS.

COLUMBUS, O., Nov. 20, 1885.

Editor of the United States Miller, Milwaukee, Wis.

DEAR SIR—We have devoted considerable time experimenting upon a short system for the manufacture of roller cornmeal. We are pleased to note that these experiments have been a gratifying success. We have been enabled to produce on this short system a meal that is fully equal to any of the best meal we have ever seen made on the more expensive and elaborate system. We enclose you to-day samples of the three products made on this system. We are enabled to obtain from a bushel of corn, or 56 pounds, about 40 pounds of pearl meal, 10 pounds of second grade or break meal, which, you will observe, is superior to the ordinary stone ground meal, and about 6 pounds of bran and offal. The yield may be reduced to 3 or 4 pouuds of offal by setting of the rolls.

We have constructed a combined machine which produces the entire separations in one machine. We are enabled under this short system to furnish all the machinery necessary for a complete 50-barrel cornmeal mill for a sum less than $1,000. There are in this system only two machines to connect to, consequently the millwrighting will be but trifling. The space occupied by these machines is not more than that of an ordinary purifier and double set of rolls. A complete cornmeal roller mill can therefore be set in any ordinary flour mill and the machinery driven from the rolls shaft, thus enabling those who are desirous of producing a high grade of roller meal to put in a complete outfit at a remarkably small expense.

THE CASE MANUFACTURING CO.
By J. M. CASE, Vice-President.

"MILLWRIGHTS—MECHANICAL ENGINEERS."

We don't hear much now-a-days from the good chaps they used to call millwrights. They don't call themselves by that name now. They call themselves mechanical engineers.

We don't want to hear from the old millwright who could pare away half a day on two or three cogs of a mortise gear. We want to know about the boys who crawl into old wheel pits to replace a stick of timber which has rotted out, and then find that 8,000 or 10,000 feet of lumber are necessary before the job is completed.

We want to know more about the everyday men who are always ready with a way to get out of a difficulty, or to get up an improvement on a process, as a matter of course.

We have been down there, and have done our share of the dirty work, and the Sunday work, too. Let's be a good, honest millwright for a day or two. We get into a mill with all the machinery lying loose, steam-engine to be set, shafting to be put up, lines run, and all the responsibility to stand. Perhaps the masons have not run their lines and levels as well as they might. Probably the levels are a "bit" out, and a mason's "bit" is never less than 4½".

Then the carpenter's work has to be remedied. The carpenter always knows where a bolt-hole must come, and he always drives a 40-penny spike in the exact spot.

The millwright has got boxes to scrape, keys to refit, new key-seats to cut with cape chisel and hammer. All the machinery seems to be on raw edges when it first starts, and the millwright has to be on deck with wrench, oil-can and brains. *You* couldn't stand it to pay a good price for your work and have all these things adjusted in the shop where they ought to be done. No! You squeezed down the price to the lowest cent, and then got what the maker could give, while we poor millwrights have to stand in the breach.

After we get the work done, then comes the hardest job, and that is to get our pay. The machine man has been paid, and so have the carpenters and masons, and if there is any money left, the millwright stands a slight show of getting some—sometime.

Perhaps we have got a job in some big concern. We are expected to keep it running all the time, and never ask much material wherewith to repair. Perhaps we have got to make alterations, and work around and over barefaced death in the shape of running machinery.

We remember once putting in a friction-clutch pulley wherewith to work a 200 H. P. Porter-Allen engine with 500 H. P. water-wheels. Well, we put it in, and then we must devise means of working the clutch-pulley from the engine-room, 150 feet distant.

A screw was devised to work the clutch lever, and geared to a shaft to reach the engine-room. Three 24" brick walls, one 36" stone, and two wooden walls were the obstructions, to say nothing of total darkness, much water and dirt. The course of the shaft was not in line with the building. It was not level. There was no way of stretching a line, either in the rooms above, or beside the place. We figured it out "and then guessed at it." We dug holes through the walls and tried to draw a line, but could do nothing with it in the dark, and, by crawling over it, kept knocking it down. We got six petticoat lamps, and trimmed them to give nice little lights, about ¼" long. We put one at each end of the shaft space, on wooden targets, and then had Mike juggle a lamp at the next bearing, until he got it exactly in line. Then he took the next lamp, and so on through the whole distance. We got that shaft in straight; built up the walls around pieces of pipe which were slipped over the shaft; got the clutch to running, and then were ready to figure on a siphon condenser for our 200 H. P. engine, or to go to the wheel-pit and set up a water-wheel step, look after the oilers or set a new steam-boiler.

At any time the poor millwright must be ready to go up to the office and listen to six months' work which must be done before Saturday night, and to stand a genteel "sheoling" because Pat or Mike burned out a box, or smashed up an engine.

We can do this work 312 days per year and be a millwright, but the chap in tight pants, who carries an indicator-box in his hand, will kick like mischief if he hears anybody call us mechanical engineers.—*By James F. Hobart, in the American Machinist.*

over, and that is the boilers may be too small for their requirements, as is often the case when large additions have been made to the machinery, without increasing the motive power. This is a trouble which can only be remedied by increased capacity; and I would remark that it is very poor economy, or rather no economy, to crowd boilers beyond a certain limit. The value of the fuel required to make the wasted heat will often much more than pay the interest on the cost of an extra boiler. Our friend, by this time, has got things pretty much to his notion in the boiler-room, and concludes he will give his particular attention to the engine. It is a nice one—mahogany staves on the cylinder, banded with brass, which, thanks to rotten-stone and his fireman's elbow-grease, shine like burnished gold. It is striped all off with gilt, and has an American eagle, with a bunch of arrows in his claws, painted on the steam-chest. It works pretty well, with the exception of a little 'chug'; by no other name can I express the peculiar sound. Now, a 'chug' may not amount to much, or it may to a good deal. Anyhow, he is going to find out where it is, if he can. And he may have some trouble, for they are often difficult to locate. With his copper hammer, he taps all the keys. They are home. Everything is as snug as will run cool. He tries his foundation-bolts, and gives the nuts an extra turn, his wrench lengthened by a piece of gas-pipe, four inches long this time. He puts a piece of stick between his teeth, shuts up both ears, and tries to find out that way. But it is no go. On Sunday, he takes the engine all to pieces, tries his crank-pin to see if it is solid, draws lines through, and sets his valves, traverses his crank. All right apparently, when he starts up, except that confounded 'chug,' not very bad, but more than is necessary. Some twenty years ago, after he had exhausted all these remedies, and the 'chug' was still there, the probability is, it would remain until the end of the chapter, unless discovered by accident. But he is not going to give it up yet awhile. If there are no attachments for the purpose he will drill some holes in the cylinder, and procure and apply one of the greatest of modern inventions, an indicator. Possibly the first diagram will show him the cause of all his trouble, and his engine will move off like a thing of life, noiselessly and majestically—a satisfaction to himself and a credit to his engineering skill; and he may at the same time discover, and be able to demonstrate, that the excess of fuel used is no fault of his, but is chargeable to the millwright. With the instrument he is master of the situation, anyhow.

I think by this time you will have discovered that our supposititious friend is pretty well posted in his business; in fact, up to the standard of a first-class engineer Without being a machinist, he can do all the running repairs necessary. He can take an engine down and set it up elsewhere, putting it in line, babbitting boxes, filing brasses, making liners, etc. Therefore we will leave him without any uneasiness, assured that when he gets out of a job, it will be no trouble for him to secure another.

The engineer is very much indebted to the inventor of the indicator. By this ingenious instrument, not only all the secrets of the engine are laid bare, but it also shows the power developed, the amount of water used for horse-power, and various other matters too numerous to mention. But to make the tests valuable, there is a certain amount of mathematical and theoretical knowledge required, as well as experience in its use. There are, unfortunately for themselves, very few manufacturing establishments in the West which own an indicator. They are expensive, and their value is not generally appreciated. It is a delicate instrument and should be handled with great care and intelligence. Now, I would suggest that it would be a good idea for this Association to own one. Put it in charge of one of your members familiar with its workings, and let him at leisure times instruct the others; and for a compensation test machinery for outside parties desiring its use; and when millowners realize its value to them in dollars and cents, it will take but a short time for it to come into general use. It is one thing you should all learn and handle. In many places, a knowledge of the indicator is an almost necessary requirement for a first-class engineer. I will admit there is one drawback to all this. In many concerns, where there is no fireman employed, a man has too much to do, to do it well. He finds that if he keeps up steam on two or three boilers, oils and wipes his engine, that by night, all the thirst for knowledge, with which he started in the morning, is verged in his desire to get his supper and go to bed. But my idea is that one of the objects of this Association is to so improve the engineers, that in time, instead of being a shoveller of coal, the employer will see that it is to his advantage (in dollars and cents, for that is the criterion) to put a cheaper man in the fire-room, and let you devote your time to a supervision of the whole, finding brains and information are more valuable than muscle. As I said in the start, I am pleased to see this organization. It is a step in the right direction. As I understand the object, you are not banded together as a trades union, but for the mutual professional benefit of all its members, and for the purpose of raising the standard of stationary engineering. Do not be afraid to ask questions of each other, and do not be slow in answering inquiries. There is not one of you but can learn something of some one else. Not one of you knows it all. I don't, anyhow. Remember the fable of the mouse who let the lion out of the net. Besides, it looks selfish for persons engaged in the same line of business, all dependant upon their labor as a support for themselves and their families, to refuse advice and assistance to a perhaps less experienced brother, whom you have considered worthy, both as a man and an engineer, to admit as a member of your Association. You have the right to say who shall be admitted, and I would advise an examination of the standing and capability of each candidate, so that in time a certificate of membership (like that of the Lake Anjiners) will be a sufficient guarantee of capability to secure any vacant position. I would make one other suggestion. Subscribe for several scientific papers; have a room where you can drop in of an evening and look over and discuss the merits of the different articles, as they appear in them. Get a library as soon as you can. Here is one of the rare occasions when it would not be derogatory to beg a little. There are idle books here in town, which their owners would be pleased to present to you on application, from which much of a scientific nature could be learned. Many manufacturing firms issue works, sent free on application, which contain much valuable information. A wooden, sectional working model of an engine would be a valuable acquisition, and can be made by any mechanic; and I would advise that some of the best informed of your members—or others—give lectures on the adjustment of the valves, an operation in which most of the science of the engine-room is centred, and complete knowledge of which is necessary to make the indicator lessons of any value. Likewise, it would not be detrimental to any one, however well he may be posted, to occasionally freshen his ideas with a little practice on the model. Lectures on other subjects, pertinent to the profession, would be in order.

Gentlemen, with many thanks for the honor you have conferred upon me this evening, for your patience in listening to my desultory remarks to the end, and wishing you success, both as an Association and as individuals, I will gracefully retire in good order."

THE WORLD'S SHIPPING.

The annual statistical summary of the shipping of the world has been recently published, and we are furnished with data for the current year. The grand total of sailing and steam vessels for 1885 amounts to 52,086, with a tonnage of 23,136,879 tons. Of this number 43,692 are sailing vessels, a decrease of 1,042 in the past year. Steam vessels have decreased 39 in number; although the tonnage of this class is a trifle greater than it was in the previous year. The decline in sailing tonnage is still going on with sure effect. Since 1876 it has fallen fully 16 per cent. in number of vessels and 12 per cent. in carrying power. On the other hand the tonnage of steam vessels has nearly doubled in the past decade. In 1876 the sailing tonnage in comparison with its rival, held the ratio of 145 to 56; now the ratio is 128 to 102. Formerly it was nearly three times as great, while at the present time it barely maintains equality, and if the present tendencies continue, will soon be far in the rear.

Of the whole number of the sailing vessels of the world Great Britain claims about one-third under her flag, North America one-sixth and Norway more than one-tenth. These are the three leading nations in this respect. Germany, Italy, Russia, Sweden and France then follow, in the order named. Spain and Greece are nearly on a level, and both are inferior to Holland. The Asiatic nations of Japan, Siam and China are credited with but 123 sailing vessels in all, carrying a tonnage of but 37,000 tons, not one-half as much as that of Portugal alone. All South America has not one-tenth of the tonnage of Norway, and if that of Central America be added in as well, the sum will not reach the tonnage of Denmark. The national order is somewhat different in the classification of steam vessels. England, of course, takes the lead, but her proportional share is still greater, for it is about two-thirds of the whole amount. France comes next, with a gross tonnage of 750,000 tons, and Germany and North America follow, with 566,000 and 545,000 tons respectively. Spain does better in this list, with 363,000 tons.—*Bradstreet's.*

RELIGIOUS ASPECTS OF PROTECTIVE TARIFF.

Furnished exclusively to THE UNITED STATES MILLER.

[Extract from a lecture on "The Humanity of the American Protective Tariff," delivered before the Wisconsin Legislature, at Grand Army Hall, Rockford, Ill., by John W. Hinton, of Milwaukee.]

Referring to the religious aspects of the protective tariff, and in refutation of the claim of free-traders that only free trade was in harmony with divine law, Mr. Hinton said:

My Friends—Richard Cobden, after whom the Cobden Club is named, said:

"Free trade is the international law of the Almighty."

That sentence is placed at the head of the *American Freetrader*, as the motto for the organ of the free trade party in this country. From what source of divine law Mr. Cobden made the selection, he never informed his countrymen or others. There is an axiom in common law that it is the duty of everyone to "take care of his own upon his own premises." Divine law says that he who fails to provide for his own household has denied the faith and is worse than an infidel.

Such, my friends, I understand to be divine law, as enunciated by an inspired source and intended for the guidance of all believers in the Scriptures. And I think that we may safely regard it as the wisest course for all of us who are Americans at heart to pursue, who desire the "promotion of the general welfare" of all the households of this country. It is the cardinal principle of this government, constituting the singularly distinctive difference between the American and all other governments. To pursue this line of thought a little further, I ask:

What is our nation but an aggregate of households? A vast number of families under one system of mutual, careful protective government, the welfare of the whole being the chief aim and specific purpose of that government. The intent and object of our national legislation is for the benefit of the people of the United States, while any benefit accruing from such legislation to any foreign people is a contingent matter of secondary or remote consideration our own welfare being first.

I have given this subject the maturest thought and most searching reflection, with opportunities for observation not possessed by all. Born on another soil, a sailor for many years, ocular demonstration was my teacher of the horrid degradation and physical sufferings of labor in my native country as compared with this. Not at one particular time, but through years of contrast—as to-day in the United States, a month hence in England, then in a couple of months back in this country. Thus, the opportunities for correct information and just deductions were beyond question.

Hence I say, as before intimated in the beginning of this lecture, that it is in the "promotion of the general welfare" of the masses, that lies the secret of the United States' success and is the cause of the prosperity of its people. So-called free trade, which nowhere exists to-day and never has existed anywhere, never was and never can be the "international law of the Almighty." That, only conforms to divine law, which shields our own households from harm or suffering, protects and guards them against every danger from without, which repels every foreign foe, be it physical, commercial or manufacturing. This plain truth is understood, comprehended and realized in every home of every American laborer.

Truly beautiful is Burns' verse:

> To make the cheerful household clime,
> For weans and wife;
> This is the true pathos and sublime,
> Of human life.

That system, or policy, of government which seeks to illumine the cottage of the laborer or the artisan, and aims to "promote his welfare" and advance his prosperity, is surely God-like. When all nations and governments regard, as we do, "the laborer of the United States as being the United States," then, and not till then, could it be truthfully said that man everywhere is fulfilling his duty to his fellow man and that the real "international law of the Almighty" is everywhere obeyed. A protective tariff aims to accomplish that purpose.

Hon. Wm. M. Evarts pointed out with perfect clearness the political principle I refer to. He said Oct. 11, 1880:

"We have undertaken, on this continent of ours to build up a fabric of politics in which every laboring man had the same share, every ignorant man had the same share, every feeble man had the same share in political power with the rich and the strong and the learned. That system we mean to maintain, and in order to maintain a system and dignity of labor which is known nowhere else in the world, and never known anywhere in the world till here and now, we mean to protect the wages of workmen from competition with the pauper systems of Europe."

The London *Times*, July 11, 1880, criticising the speeches of the president of the Cobden Club and John Bright, said of the fostering care and protection of the labor of this country:

"The United States do not approach the question from the same standpoint as ourselves. The object of their statesmen is not to secure the largest amount of wealth for the country, but to keep up by whatever means, the standard of comfort among the laboring classes."

Nowhere have I ever seen this grandly humane feature of our tariff system better explained than it was in the Chicago *Inter-Ocean* of Dec. 15, 1880. I have frequently quoted it. It cannot be too often repeated:

"A protective tariff stands at the elbow of every laboring man in this country to help him to better wages, to a more independent condition, and to a higher development of his faculties. It is the refuge for his weakness and the bulwark of his strength. Above all other classes of toilers, protection commends itself to the serious consideration and the unflagging support of the colored man, because it is the mortal enemy of human bondage in every form."

General Garfield happily expressed it all in a few words:

"We legislate for the people of the United States, and not for the whole world, and it is our glory that the laborer of the United States is more intelligent and better paid than his foreign competitor."

A virtual incorporation into the policy of the government, that "the laborer is worthy of his hire," with legislative enactments to practically carry out that principle, seems to me to be obedience to divine law, far more so than the enunciation of the free trade theory of England, that "in order to give capital a fair remuneration, the price of labor must be kept down." The one system protects the capitalist, or rich man, specifically. Our American system, or principle, is for the protection of those who labor, for the benefit of the poor man, for, as John Bright says, "Labor is honored more in the United States than in any other country in the world."

"By their fruits ye shall know them." Contrast the two countries. Labor in the United States respected and honored everywhere. England furnishes ample evidence of the degradation, misery and suffering of her laboring classes, not alone through the columns of her Thunderer's statement that "In England man is a drug, and population is a nuisance," but in the report of her Registrar General, that of "the total number of deaths in 1879, one out of every fifteen died in a work-house; while in London, the richest city in the world, one out of nine died in the work-house. * * * One out of about every seven end their days as paupers."

It must be a curious divinity that shapes the ends of the Cobden Club in its efforts to carry out the "International law of the Almighty." An English journal thus records their missionary labors:

"The missionary has lately entered in such close partnership with the trader, that the people of the countries they wish to "open up," must be in doubt whether it is our Bible or broadcloth, our cotton or our Christianity that we most desire to force upon them, and the attempt to compel them to accept a spurious Christianity and shoddy manufactures by means of bayonets and cannon is not likely to be permanently successful."

For the Cobden Club of England, with its hundred and thirty-five American members in this country, the tools of English manufacturers, to call Christianity to its aid, or citing it in its own justification, is simply a a devilish mockery of all that is divine:

> "The Devil can cite Scripture for his purpose.
> An evil soul producing holy witness,
> Is like a villain with a smiling face,
> A goodly apple, rotten at the core."

History repeats itself, and I cannot better conclude this part of my lecture than by reciting to you an interesting extract from American history, familiar to some present. Joseph Warren in his memorable oration of March 6, 1775, at Boston, in commemoration of the Boston massacre, said:

"The tools of power, in every age, have racked their inventions to justify the few in sporting with the happiness of the many; and, having found their sophistry too weak to hold mankind in bondage, have impiously dared to force religion, the daughter of the King of heaven, to become a prostitute in the service of hell. They taught that princes, honored with the name of Christians, might bid defiance to the founder of their faith, might pillage pagan countries and deluge them with blood, only because they boasted themselves to be the disciples of that teacher, who strictly charged his followers to do to others as they would that others should do unto them."

"My husband is so poetic," said one lady to another in a Seventh street car the other day.

"Have you ever tried rubbin' his joints with hartshorn liniment," interrupted a beefy looking woman with a market basket at her feet, who was sitting at her elbow and overheard the remark. "That'll straighten him out as quick as anything I know of, if he hain't got it too bad."

WALL STREET SLANG.

Stock-brokers have a dialect of their own that is caviare to the crowd. Like the trade-marks and "shop" terms of merchants, it must be explained to be intelligible to the multitude. It is pithy, pungent, scintillating, and sometimes rank. It precisely characterizes every variation and aspect of the market. A broker or operator is "long of stocks" when "carrying" or holding them for a rise; "loads" himself by buying heavily, perhaps in "blocks" composed of any number of shares—say 5,000 or 10,000—bought in a lump, and is therefore a "bull" whose natural action is to lower his horns and give things a hoist. He "forces quotations" when he wishes to keep up the price of stock; "balloons" it to a height above its intrinsic value by imaginative stories, fictitious sales, and kindred methods; takes "a flier," or small side venture, that does not employ his entire capital; "flies kites" when he expands his credit beyond judicious bounds; "holds the market" when he buys sufficient stock to prevent the price from declining; "milks the street" when he holds certain stock so skillfully that he raises or depresses prices at pleasure, and thus absorbs some of the accessible cash in the street; buys when the "market is sick" from over-speculation; keenly examines "points"—theories or facts—on which to base speculation; "unloads" when he sells what has been carried for some time; has a "swimming market" when all is buoyant; "spills stock" when he throws great quantities upon the market, either from necessity or to "break," *i. e.*, lower the price. He "saddles the market" by foisting a certain stock upon it, and is "out of" any stock when he has sold what he held of it.—*R. Wheatley in Harper's Magazine for November.*

ITEMS OF INTEREST.

A FORGE IN AFRICA.—In his account in the London *Graphic* of his journey to Kilimanjaro, Mr. H. H. Johnston describes a native forge: "The Ma-Chaga are clever smiths, and forge all kinds of utensils, weapons and ornaments from the pig iron they receive from country of Usanga, near Lake Jipé. The forge is but a pair of goat-skin bellows, converging into a hollow cone of wood, to which are added two more segments of stone, pierced through the center, and ending in a nozzle which is thrust into the furnace of charcoal. The bellows are kept steady by several pegs thrust into the ground, and a huge stone is often placed on the pipe to keep it firm. After the iron has been heated white hot in the charcoal, it is taken out by the iron pincers and beaten on a stone anvil. The Chaga smiths not only make spear blades and knives of apparently tempered steel, but can fabricate the finest and most delicate chains.

THE Submarine Telegraph Cables of the world are owned by twenty-six different companies and represent an aggregate capital of one hundred and seventy-five million dollars. A plan has been recently proposed that the nations of the world form an international syndicate, purchase these lines, fix a uniform toll rate barely sufficient to pay a low interest on the cost, and give to the people the benefits of cheap rates. Although backed by some prominent names in England, the idea has not received much attention, and would seem to be somewhat utopian.

LEGAL DEFINITIONS OF INSURABLE INTEREST.

The following extracts are taken from an article by Mr. Guy C. H. Corliss in the Albany *Law Journal:*

Starting with the admitted principle that a policy of insurance in favor of a person who has no insurable interest in the life insured is generally void, the question naturally arises as to what constitutes an insurable interest within the meaning of this rule. The United States Supreme Court have stated the general rule with admirable precision and clearness in Warnock vs. Davis, 104 U. S., 775: "It is not easy to define with precision what will in all cases constitute an insurable interest so as to take the contract out of the class of wager policies. It may be stated generally, however, to be such an interest, arising from the relations of the party obtaining the insurance either as creditor of or surety for the assured, or from the ties of blood or marriage to him, *as will justify a reasonable expectation of advantage or benefit from the continuance of his life.* It is not necessary that the expectation of advantage or benefit should be always capable of pecuniary estimation; for a parent has an insurable interest in the life of his child, and a child in the life of his parent; a husband in the life of his wife, and a wife in the life of her husband. The natural affection in cases of this kind is considered as more powerful—as operating more efficacious—to protect the life of the insured than any other consideration. But in all cases there must be a reasonable ground, founded upon the relations of the parties to each other, either pecuniary or of blood or affinity, to expect some benefit or advantage from the continuance of the life of the insured; otherwise the contract is a mere wager by which the party taking the policy is directly interested in the early death of the assured. Such policies have a tendency to create a desire for the event. They are, therefore, independently of any statute on the subject, condemned as being "against public policy." It will be seen from the concluding sentence of this extract from the opinion that the National Supreme Court considered it as settled law that such contracts were void at common law. It cannot be said that in the present state of the law on the subject every statement of an insurable interest contained in or the general rule laid down in the foregoing opinion has the support of adjudications. But the principle which it is there stated should govern in the determination of the question of an insurable interest is so just and so consistent with the reasons on which wager policies are declared to be void, that it must ultimately be adopted by every American court. The substance of the opinion may be summed up in the following questions: Has the person for whom the insurance is obtained any pecuniary interest in the life insured? Is he so connected by consanguinity or affinity with the person whose life is insured that it is highly improbable that he would gamble on the uncertainty of such life, and that it is highly improbable that any pecuniary consideration would prompt or tempt him to destroy such life or desire its termination? If either of the foregoing questions can be answered in the affirmative the policy is valid. Perhaps the views of the writer are hardly sustained by the opinion last cited but they seem to rest on the fundamental principles which underlie all the authorities.

The next inquiry is what has been settled on the subject of insurable interests by judicial decisions.

That a wife has an insurable interest in the life of her husband has been decided by every court before which the question has come. Baker vs. Union Mutual Life Insurance Company, 43 N. Y. 283. * * * Connecticut Mutual Life Insurance Company vs. Schaefer, 94 U. S. 457; Warnock vs. Davis, 104 id. 775; Fowler vs. Butterly, 78 N. Y. 73; Thompson vs. A. T. Life & Savings Insurance Company, 46 id. 674; Mutual Life Insurance Company vs. Allen (Massachusetts Supreme Court), 30 Alb. L. J. 363.

A husband has no insurable interest in his wife's life. Charter Oak Life Insurance Company vs. Brunt, 47 Mo. 419. But an insurable interest in the life of his wife was held to exist in Connecticut Mutual Life Insurance Company vs. Schaefer, supra. In this last case the court held that the policy being valid in its inception, the subsequent divorce of the parties would not vitiate it. To same effect, Olmsted vs. Keyes, 85 N. Y. 601, and Bliss Life Insurance, § 30. See also McKee vs. Phœnix Insurance Company, 28 Mo. 383.

In Chisholm vs. National Capitol Life Insurance Company, 52 Mo. 213, the court went far beyond all precedents and sustained a policy of insurance on the life of a man in favor of his betrothed. This decision, however, is unquestionably correct on principle.

The English law would seem to be opposed to a policy issued on the life of a child in favor of the father. Halford vs. Kymer, 10 B. & C. 724. But the rule is just the reverse in this country. All the cases sustain the insurability of the interest which the father has in the life of his child. Connecticut Mutual Life Insurance Company vs. Schaefer, 94 U. S. 457. * * * * *

A mother has been held to have an insurable interest in the life of a child. Reif vs. Union Mutual Life Insurance Company, 17 Ins. Chron. 13.

* * * * * *

A brother has no insurable interest in the life of his brother. Lewis vs. Phœnix Mutual Life Insurance Company, 39 Conn. 100. Neither has an uncle in the life of his nephew. Singeton vs. St. Louis Mutual Life Insurance Company, 66 Mo. 63. Nor nephew in life of uncle. Mowry vs. Home Life Insurance Company, 9 R. I. 346. But a sister has been held to have an insurable interest in the life of her brother, on whom she is dependent; Lord vs. Dale, 12 Mass. 115; and a married sister in life of brother, on whom she is dependent. Frances vs. Etna Life Insurance Company, 2 Ins. L. J. 657. The right to recover on the policy in the first case was based, not on the mere relation existing between the parties, but on the fact that the sister had a pecuniary interest in her brother's life because of her dependence on him. It is not necessary that there should have been a valid marriage between the person whose life is insured and the beneficiary. It is sufficient if the parties are living together as husband and wife. Equitable Life Insurance Company vs. Paterson, 41 Ga. 338; Estate of Mueller, 31 Alb. L. J. 283. In each of these cases it appeared that the husband whose life was insured in favor of the woman with whom he was living as his wife, had another wife living at the time the policy was issued; and yet both policies were sustained. * * * * *

A creditor has an insurable interest in the life of his debtor. Rawls vs. American Mutual Life Insurance Company, 27 N. Y., 282. * * * Goodwin vs. Massachusetts Life Insurance Company, 73 N. Y., 497. * * * * While it is true that a creditor has an insurable interest in the life of his debtor, that interest is not unlimited. The creditor cannot arbitrarily insure the life of his debtor in any amount irrespective of the amount of the debt. It has been expressly held that he cannot take out a policy largely in excess of his claim. Fox vs. Pennsylvania Mutual Life Insurance Company, 4 Big. L. & A., Ins. Cas. 458; Morrell vs. Trenton Mutual Life and Fire Insurance Company, 10 Cush., 282.

That he may insure his debtor's life in an amount exceeding his claim is settled by authority and clear upon principle. If he were limited to the actual sum due, he could never obtain indemnity, for the premimus paid would steadily reduce the net amount to be received under the policy, and the interest accruing would increase at the same time the amount of his claim. The following case sustains this doctrine: Goodwin vs. Massachusetts Mutual Life Insurance Company, 73 N. Y. 480. In this case the amount of the debt was $1,200, and the court sustained a policy of $5,000. The authority however is somewhat weakened by the fact that the insured was the sister of the person whose life was insured. The court seems to have based its conclusion, in part at least, on the ground of the relation existing between the parties. * * * In Bevin vs. Connecticut Life Insurance Company, the amount loaned was $300, and the court sustained a policy of $1,000. In Hoyt vs. New York Life Insurance Company, the policy was $1,000, and the sum advanced about $200. The policy was held valid. It is true that in each one of these cases the insured had an interest in the life of the debtor exceeding the amount of the debt, as he was to share in the profits, but that interest was not capable of being accurately or even approximately estimated; and the cases are therefore authorities for the general doctrine, that when the interest of the insured is merely a pecuniary one, it is not necessary that it should be susceptible of a definite valuation, and that the amount of recovery is not limited by the actual pecuniary loss sustained by the death of the debtor.

It has been held that a master has an insurable interest in the life of a skilled servant whom he has employed for a certain period. Hebdon vs. West, 3 Best & S. 578.

In Conn. Mut. Life Ins. Co. vs. Luchs, 108 U. S. 498 (28 Alb. L. J. 77), the court decided that a partner has an insurable interest in the life of his copartner.

It is not, however, always necessary that the person holding the policy should have an insurable interest in the life insured, to entitle him to recover on the policy. The doctrine of wager policy seems to apply in only those cases where the insured himself attempts to procure a policy on his motion, and without the original solicitation or application of the person whose life is insured. The following rule may now be considered

as definitely established in most jurisdictions in this country; that when the person whose life is insured voluntarily, without the request or solicitation of the person to whom the policy is made payable, procures an insurance on his own life, and then has the loss made payable even to one having no insurable interest in his life, the policy is valid. Olmsted vs. Keyes, 85 N. Y. 593; Campbell vs. New England Mutual Life Insurance Company, 98 Mass. 381. * * * * Connecticut Mutual Life Insurance Company vs. Schaefer, 94 U. S. 457. * * * * The fact that the beneficiary pays the premiums is not conclusive against the policy where he has no interest in the life insured. The policy may nevertheless be valid. Triston vs. Hardey, 14 Beav. 232; Armstrong vs. Mutual Life Insurance Company, 13 Rep. 711; Langdon vs. Union Mutual Life Insurance Company, supra.

But where the policy is taken out at the instigation of the beneficiary it is void unless he can show an insurable interest. Wainwright vs. Bland, 1 Mees & W. 32.

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AN EXTRAORDINARY METHOD OF SURVEYING FOR WATER.—From an English exchange we extract the following: "A series of interesting experiments in the system described as that of finding water by the divining rod were made on the premises of Messrs. Fremlin Brothers, the well-known brewers of Maidstone, Kent. The operator was John Mullins, a stone mason, of Chippenham, Wilts, who claims, by means of the 'divining rod,' to possess the power of indicating where water may be found. The genuineness of his claim is attested by several noblemen, members of Parliament, country gentlemen and others. Operations, or rather what may be better described as prospecting efforts, were begun on ground back of the brewery premises facing the brewery on Earl street. Described briefly, the *modus operandi* was as follows: Mullins was provided with a hazel twig, cut in the shape of a V. Holding the twig in both hands, with the point held downwards, he walked slowly through the ground. He had proceeded some distance when the twig turned up and here he made a mark on the ground. He then went to the end of the ground, and coming back again the twig turned up at the same spot, indicating that water would be found there. As the result of the experiments, the existence of two good springs, at a depth of from twenty to twenty-five feet, was indicated in the sheds, three others by the side of a grass bank and two in the yard of Mr. Jesse Ellis. Several of the persons present held, during the stages of the experiments, one end of the forked twig, but despite the efforts to hold it firmly, the point of the V twisted up with great force. Mullins appears to be an honest, unpretentious man, and his *bona fide* finds of water are attested by men of unimpeachable reputation. We believe the power he possesses he attributes to the possession of magnetic or electric influence. For testimonies to the success of his indications he refers, amongst others, to Lord Jersey, Middleton Park, Oxfordshire; Lord Leigh, Stoneleigh Abbey; and Mr. Hornsby, of Grantham."

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AN Irishman, quarreling with an Englishman, told him, if he didn't hold his tongue, he would break his impenetrable head, and let the brains out of his empty skull.

PAPA (soberly)—"That was quite a monstrosity you had in the parlor last evening."

Maud (nettled)—"Indeed! That must depend on one's understanding of the term 'monstrosity.'"

Papa (thoughtfully)—"Well, two heads on one pair of shoulders, for example."

MILLING PATENTS.

The following list of patents relating to milling interests, granted by the U. S. Patent Office during the past month, is specially reported by Stout & Underwood, Solicitors of Patents, 66 Wisconsin st., Milwaukee, Wis.

Issue of Nov. 3, 1885. No. 329,498—Flour purifier, S. Spitzer, Vienna, Austria; No. 329,710—Grain elevator, G. S. Bricker, Newville, Pa.; No. 329,712, Apparatus for filling sacks and weighing the contents thereof, P. and C. Cailleux, Gironville, France; No. 329,729, Grinding mill for reducing grain, L. Gathmann, Chicago, Ill.

Issue of Nov. 10th, 1885—No. 330,264, Roller mill, H. F. Saint Requier, Paris, France; No. 330,288, Roller mill, F. H. Bolte and H. G. Thede, Milwaukee, Wis.

Issue of Nov. 17th, 1885—No. 330,665, Mill-stone dress, A. S. Baker, Evansville, Wis.; No. 330,745, Middlings purifier, G. F. Sherwood, Jackson, Mich.; No. 330,746—Middlings purifier, C. A. Smith, Jackson, Mich.

Issue of Nov. 24th, 1885—No. 330,830, Grinding mill, J. J. and E. T. Falkner, McMinville, Tenn.; No. 330,934, Grinding mill, G. K. Smith, Chicago, Ill.; No. 331,058, Mechanism for extinguishing fires in grain or malt mills, C. J. Hexamer, Philadelphia, Pa.; No. 331,061, Cockle separator, F. W. Howell, Buffalo, N. Y.; No. 331,074, Grain scourer, M. McMahon, Bucyrus, Ohio; No. 331,087, Grinding mill, W. G. Rundlett, Freeport, Ill. No. 331,138, Grain dryer, G. H. Immendorf, Philadelphia, Pa.; No. 331,165, Machine for splitting wheat, T. Sheldon, Oxford, England; No. 331,240, Reel-bolt, O. P. Hurford, Oakdale, Neb.; No. 331,265, Flour-bolt, B. W. Tuttle, Council Hill, Ill.

THE USE AND ABUSE OF MACHINERY.

This thought is suggested by our reading the account of how, as the article states, a very capable man, who had charge of a stationary boiler, saved himself the labor of filling a new one by hand. Not having the pump connected, this capable man threw a few buckets of water into the boiler and closed up the openings; he then built a fire in the furnace and when he had heated it up sufficiently to evaporate the water and raise steam to drive out the air, he opened the communication to a reservoir of water under the floor. The steam in the boiler coming in contact with this cold water was immediately condensed, thus forming a vacuum and transforming the boiler into a condenser. The cold water then rushed in to fill the space, and of course he filled his boiler and saved himself some labor, utterly oblivious to the fact of the great risk of straining the joints and rivets.

Evidently such a process of generating steam in a boiler with only a small portion of the bottom covered with water, and the remainder of the surface exposed to the direct action of the flame, must result in a very unequal heating of the plates and joints, and, anyone would suppose, would be sufficient to cause leakage. But to add to this, the sudden influx of a stream of cold water, which striking these heated plates causes an almost instantaneous contraction of the metal coming in contact with it, the result sooner or later is certain. We are certainly astonished at two things—the incapacity of the man, and the tenacity and elasticity of the boiler, to endure such abuse.

How often do we find boilers driven up to the end of the day's work, and within an hour or so after the fires are drawn, with hot walls, and under a pressure of 40 or 50 pounds of steam, the water is blown out, and cold water allowed to flow in to cool them off for examination or repairs. Is it any wonder that seams are strained and tube joints started? The steam boiler-feeder, for some cause or other, does not perform satisfactorily, it stops or moves with a jerking motion. How often do we find the man taking a hammer and pounding this or that about it, to, as he says, jar it loose so that it will run. And so on, through the whole category of mechanical appliances, we find these capable men abusing them.—*American Engineer.*

FIRE APPARATUS IN THE PILLSBURY A MILL.

It is becoming so that one of the most expensive items of furnishing our mills is that of supplying them with fire apparatus. Nothing that ingenuity can devise, whether the whim of an insurance man, or a meritorious invention, is left out of the calculation. The Washburn A and Pillsbury A mills are the most perfectly equipped in this respect. The latter is now receiving the automatic fire sprinkler at no small expense. When this is put in, the fire apparatus of the mill will consist of 3,200 feet of hose (1,550 feet 2½ inch, 1,500 feet 1 inch, and 150 feet 1½ inch), 1 hundred-gallon and 2 sixty-gallon chemical extinguishers located on the sixth floor, also a sixty-gallon chemical in the basement, 17 Champion fire extinguishers, automatic hose reels, 7 dozen fire axes, 35 water barrels with 2 pails to each, 200 water pails, etc. There are stand-pipes extending from the basement to the attic with 1,100 feet of hose attached. Electric fire alarms cover all parts of the building. The mill was formerly supplied with hand grenades, but the proprietors losing faith in their efficiency, they have been supplanted by water buckets. In the bran house connected with the mill, there are 325 feet 2½ inch hose, in the elevator 400 feet 2½ inch hose, 16 water barrels, 7 Champion fire extinguishers; and in the engine and boiler rooms 100 feet of hose. P. T. Quinn has charge of the apparatus, and gives its care his entire attention. The men in the mill, especially on the packing floor, are drilled in the use of the apparatus, and each person knows his place in case of a fire. A few days since, a number of fire insurance men were visiting the mill, and on their approaching the packing floor, Mr. Quinn touched off the fire alarm. The forty or fifty employes in that story rushed to their respective posts and were ready for action inside of ten seconds. The automatic sprinklers, which are now being introduced will reach 400 or 500 in number, and be placed in all parts of the premises.—*Northwestern Miller.*

ACCORDING to the Philadelphia *Record* Hungarian, Polish and Chinese labor is offensive to Americans for more reasons than that it is cheap. A negro miner will dig five wagons of coal a day and spend all his wages in a new silk shawl for his wife, candy for the children and steak for the table. If an Irish miner's child dies all hands "knock off" and go to the funeral in their best clothes. The English miner will celebrate the Queen's birthday over a pot of ale and call in all the boys. A Hungarian miner will dig two wagons of coal a day and put his pay in his sock, if he has one (which is seldom), and if his child dies he boxes it up in an old soap-box and digs a hole after working-hours and buries it himself. The Pole would not think of spending money for beer, and the "heathen Chinee" garners every penny. Of the one hundred Hungarians at work in the coke regions twenty months ago less than one-third now remain.

HE BOUGHT THEM CHEAP.—It was at a certain country hotel in Northern Michigan. The single stranger who sat down for dinner was amazed when the waiter handed him a printed bill of fare which began with oyster soup and clam chowder and ran down to four kinds of pie and chocolate ice-cream.

"I'll take oyster soup," said the guest.

"Y-e-s, but we haven't got any," replied the waiter.

"Very well, give me clam chowder."

"We are out of that too."

"Then bring me baked whitefish, fried sausage, Saratoga potatoes, French wheat rolls, ribs of beef and a cup of coffee."

"We haven't got any, sir. All we've got is beef steak, b'iled taters, and baker's bread and coffee."

At the last moment the landlord entered the room, and the guest called out:

"See here, landlord, but what sort of a trick is this?"

"What? Oh, that bill of fare. My dear sir, let me explain. My uncle kept a summer resort hotel, and he failed. He had 30,000 bills of fare on hand, and I bought them at private sale for $2. These are hard times—very hard, and we must utilize everything, and keep up style at the same time."

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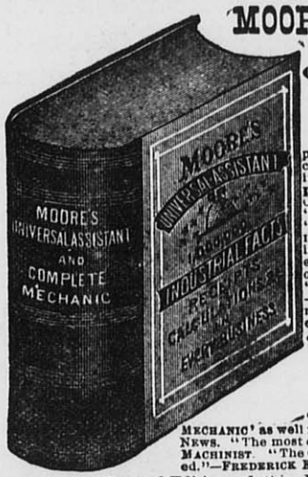

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